

I. SALTATORIAL ORTHOPTERA FROM SOUTH AMERICA AND THE ISLE OF PINES.

BY LAWRENCE BRUNER.

INTRODUCTORY.

The following pages relate to a rather considerable number of saltatorial Orthoptera collected for the Carnegie Museum in Argentina and Bolivia by Mr. José Steinbach, and in French Guiana and the State of Pará, Brazil, by Mr. S. M. Klages. A few species from the Isle of Pines, collected by the late Mr. G. A. Link, Sr., and his associates, are included in the report. The latter were obtained some years ago, but the collections made by Mr. Steinbach, and those made by Mr. Klages, have come into the possession of the Museum in quite recent years. The writer in the spring of 1919 was prepared to submit a report upon those parts of this assemblage of insects which had at that time come into his hands, but the receipt of later collections made in the remote interior of French Guiana and about Pará by Mr. Klages, seemed to make it preferable to withhold this report, until the more recently acquired material could be studied and the results of such investigation incorporated with what had already been written. This was a fortunate decision, as the material alluded to, which was received by the Museum in the summer of 1919, proved to be rather interesting, and to contain a number of apparently undescribed forms. Every sending of insects from the little-visited parts of tropical America reveals the fact that our knowledge of the fauna is not yet complete. In the papers upon the Orthoptera of the American tropics, which the writer has presented in the pages of the ANNALS of the Carnegie Museum, including the present report, there have been described over two hundred and sixty (264) species new to science. The types of these species are of course all preserved in the Museum in Pittsburgh, where they may be consulted by future students of the order.

In this, as in former papers by the writer issued by the Carnegie Museum, synoptic keys of the species in a given genus have been



frequently given, and occasionally keys to the genera themselves have been supplied.

Order SALTATORIA.

Part I.—Suborder *LOCUSTOIDEA*.

LOCUSTS OR SHORT-HORNED GRASSHOPPERS.

The insects, which are included in this suborder of the Saltatorial Orthoptera, are very numerous and widely scattered over the surface of the earth, wherever there is sufficient vegetation to afford them sustenance and where they may find security against some of their host of enemies. Of course, as might be expected, the species and individuals are most abundant in warmer and more humid regions. Nevertheless comparatively numerous representatives of the group are to be met with in hot, arid regions, as well as in cooler countries towards the poles.

In the introductions to the sections dealing with families, contained in former papers on these insects, I have written somewhat extensively upon their life-histories, food-habits, and distribution. I will not here repeat what already has been said upon these subjects.

In the present paper over thirty supposedly new forms are characterized. We may readily infer, that, when the entire South American continent shall have been thoroughly explored, and its orthopterous fauna collected and studied, there will be still many more species of these insects discovered and made known to science.

Family TETRIGIDÆ (*Acrydiidæ*).

The present collection contains a number of "grouse-locusts" several of which appear to be undescribed. Undoubtedly considerable additions remain to be made to our present knowledge of these interesting little insects, so far as South American forms are concerned. In 1910 the present author published in the *ANNALS* (VII, pp. 89-143) a special paper on these insects based on a quite extensive collection belonging to the Carnegie Museum. While that paper was not intended to be a regular synopsis or monograph of the group under consideration so far as South American forms are concerned, it was nevertheless a rather full review. Since that time both the writer and several others have added to that which was known about them for the region.

Without here attempting to give additional notes on their haunts, distribution, habits, etc., I may refer the student of the group to my former paper for hints as to these matters.

Genus *COTYS* Bolivar.

Cotys BOLIVAR, Ann. Soc. Ent. Belg., xxxi, pp. 186, 194, 247 (1887); HANCOCK, Gen. Ins., Fasc. 48, Orth., Acrid. Tetr., pp. 30, 35 (1906).

The genus *Cotys* belongs solely to the American hemisphere and contains but a single representative.

1. *Cotys antennatus* Bolivar.

Cotys antennatus BOLIVAR, Ann. Soc. Ent. Belg., xxxi, pp. 186, 247, No. 1 (1887); HANCOCK, *l. c.*, p. 35, No. 1, pl. 4, fig. 34 (1906).

This species is represented by two specimens, male and female. They come from the Rio Japacani in eastern Bolivia, where they were taken by J. Steinbach in February, 1915. C. M. Acc. No. 5573.

Genus *AMORPHOPUS* Serville.

Amorphopus SERVILLE, Ins. Orth., p. 756 (1839); BOLIVAR, Ann. Soc. Ent. Belg., xxxi, pp. 186, 194, 250 (1887); HANCOCK, Gen. Ins., Fasc. 48, Orth., Acrid. Tetr., pp. 31, 36 (1906).

The genus *Amorphopus* is made up of several species of tropical American grouse-locusts, which rather closely resemble each other. They are to be met with either on rocks in or at the margins of streams, or on the trunks of trees and on rocks in damp, shady situations, where mosses and lichens abound.

2. *Amorphopus notabilis* Serville.

Amorphopus notabilis SERVILLE, Ins. Orth., p. 757, No. 1, pl. 13, fig. 5 (1839); BOLIVAR, *l. c.*, pp. 186, 250, 252, No. 5, pl. 5, figs. 20, 20a-b (1887); HANCOCK, *l. c.*, p. 37, No. 1, pl. 4, fig. 38 (1906); BRUNER, Ann. Carnegie Mus., VII, pp. 90, 97 (1910).

Only a single female specimen of this species is at hand. It comes from eastern Bolivia, where it was captured in February by J. Steinbach. C. M. Acc. No. 5573.

Genus *EOMORPHOPUS* Hancock.

Eomorphopus HANCOCK, Gen. Ins., Fasc. 48, Orth., Acrid. Tetr., pp. 31, 37 (1906); BRUNER, Ann. Carnegie Mus., VII, pp. 90, 98 (1910).

The representatives of this genus belong to the South American tropics. They may be separated from those of the preceding genus

by their less flattened or depressed bodies and the non-clypeate anterior femora.

3. *Eomorphopus granulatus* Hancock.

Eomorphopus granulatus HANCOCK, *l. c.*, p. 38, no. 2, pl. 4, figs. 35, 35a (1906);
BRUNER, *l. c.*, p. 98 (1910).

The following listed material is at hand: 1 ♂, 4 ♀ ♀, Benevides, Pará, Brazil, October 1918 (S. M. Klages), Acc. No. 6174; 1 ♀, Oucatopi Island, June, 1918, Acc. No. 6178; 1 ♀, Cayenne, Acc. No. 5897; 1 ♀, Mana River, French Guiana, May, 1917, Acc. No. 6008.

Genus *PLATYTETTIX* Hancock.

Platyttix HANCOCK, *Ent. News*, XVII, 1906, 88; *Gen. Ins.*, Fasc. 48, *Orth. Acrid. Tetr.*, 1906, 39; BRUNER, *Ann. Car. Mus.*, VII, 1911, 99.

4. *Platyttix arcuatus* sp. nov.

Having the same general appearance as the remainder of the representatives of the genus *Platyttix*, but a little smaller than either *gibbinotus* or *uniformis*, which were characterized in a former number of the ANNALS (Vol. VII, pp. 99-100, 1910). In the synoptic table for the separation of the known species of the genus the present form falls between the two here referred to. If we include this species, the key should be modified as follows:

KEY TO THE SPECIES OF *PLATYTETTIX*.

- A. Pronotum strongly reticulate and gibbous.
 - b. Larger (8 to 9 mm. in length).
 - c. Apex of the anterior edge of the posterior lateral lobes of the pronotum greatly produced and acuminate. *reticulatus* Hancock.
 - cc. Apex of the posterior lateral lobes but little produced.
 - gibbinotus* Bruner.
 - bb. Smaller (6.5-7 mm. in length). The posterior lateral lobes but little produced, nevertheless still angulate. *arcuatus* sp. nov.
 - AA. Pronotum comparatively smooth. The posterior angles of the lateral lobes roundly angulate (7 mm.). *uniformis* Bruner.

As seen by an examination of the above key, *arcuatus* has the pronotum moderately gibbous, but is smaller than the others. The pronotum is rather greatly elevated on its anterior half and evenly arcuate and ascending from the front edge to the point of its greatest

height, where it suddenly and a little obliquely drops to a level with the anterior edge. The lower apical half of the disc of the pronotum is nearly flat, and provided with several oblique carinæ, which extend from the well-marked nearly equal and smooth median carina to the lateral edges. The anterior margin at middle straight, the apex is sharply acuminate and extends little, if any, beyond the apex of the valves of the ovipositor. The gibbositities are chiefly confined to the lateral lobes anteriorly and below the lateral carinæ. The lobes of the carinæ of the anterior and middle femora are less well-defined than in *reticulatus*, especially is this true with reference to the superior ones. Front, frontal costa, and vertex about normal for the genus.

General color dark brunneo-fuscous, varied with pale testaceous and dull cinereous. Anterior and middle tibiæ fasciate, the apical portion of the tarsi infuscated. Hind femora with their apical half and the tibiæ largely testaceous, marmorate with browns. Apical depressed portion of the disc of the pronotum pale testaceous. Apical four or five joints of the antennæ pallid, the middle ones infuscated, while those at the base are more or less varied with testaceous. Dorsal carina of the pronotum alternately pallid and fuscous.

Length of body, ♀, 6.5 mm.; of pronotum, 6 mm.; of hind femora, 4 mm.

Habitat: The only specimen at hand, the type, bears the label "Pied Saut, Oyapok River, French Guiana, S. M. Klages, C. M. Acc. No. 6111." It was taken in November, 1917.

Genus CRIMISUS Bolivar.

Crimisus BOLIVAR, Ann. Soc. Ent. Belg., xxxi, p. 246 (1887); HANCOCK, Gen. Ins., Fasc. 48, Orth. Acrid. Tetr., pp. 31, 40 (1906); BRUNER, Ann. Carnegie Mus., VII, pp. 91, 103 (1910).

The only representative of the genus at hand is a single specimen of the following species.

5. *Crimisus patruus* Bolivar.

Crimisus patruus BOLIVAR, *l. c.*, p. 247 (1887); HANCOCK, *l. c.*, p. 40 (1906); BRUNER, *l. c.*, pp. 103, 104 (1910).

1 ♂, Rio Japacani, eastern Bolivia, Feb., 1915, J. Steinbach, collector. C. M. Acc. No. 5573

Genus OTUMBA Morse.

Otumba MORSE, Biol. Cent.-Amer., Orth., II, pp. 5, 7 (1900); HANCOCK, Tett. N. Amer., pp. 34, 50 (1902); *IB.*, Gen. Ins., Fasc. 48, Orth. Acrid. Tetr., pp. 32, 43 (1906); BRUNER, Ann. Carnegie Mus., VII, pp. 91, 110 (1910).

A strictly tropical American genus containing several rather common species.

6. *Otumba lobata* Hancock.

Otumba lobata HANCOCK, *l. c.*, 2nd reference, pp. 44, 45, no. 4 (1906); BRUNER, *l. c.*, pp. 110, 111 (1910).

This grouse-locust is represented in the material now being reported upon by the following specimens: 1 ♂, 2 ♀ ♀, Mana River, May, 1917, C. M. Acc. No. 6008; 1 ♀, Pied Saut, Oyapok River, French Guiana, Dec., 1917, S. M. Klages, collector, C. M. Acc. No. 6111.

Genus ALLOTETTIX Hancock.

Allotettix HANCOCK, Ent. News, x, p. 276 (1899); *IB.*, Tettig. N. Amer., pp. 126, 127 (1902); *IB.*, Gen. Ins., Fasc. 48, Orth. Acrid. Tetr., pp. 48 (1906); BRUNER, Ann. Carnegie Mus., VII, p. 114 (1910).

Allotettix is another of our tropical American genera of grouse-locusts. Its representatives are all extremely slender insects with greatly lengthened wings and pronotal shield. Eight species have been recognized and characterized. At least three of these are found among the material now being examined.

7. *Allotettix chipmani* Bruner.

Allotettix chipmani BRUNER, Journ. N. Y. Ent. Soc., XIV, p. 146 (1906); *IB.*, Ann. Carnegie Mus., VII, pp. 115, 116 (1910); HANCOCK, Gen. Ins., Fasc. 48, Orth. Acrid. Tetr., p. 48 (1906).

There are quite a number of specimens of both sexes of this insect before me as I write. They come chiefly from the Mana River in French Guiana and were taken during the months of May and June, 1917. C. M. Acc. No. 6008. Three other specimens are also at hand, which are referred to this species, one male and two females, from the Oucatopi Island, where they were taken in June, 1918, by S. M. Klages. C. M. Acc. No. 6178.

8. *Allotettix peruvianus* (Bolivar).

Paralettix peruvianus BOLIVAR, Ann. Soc. Ent. Belg., XXXI, p. 272 (1887).

Allotettix peruvianus HANCOCK, Gen. Ins., Fasc. 48, Orth. Acrid. Tetr., p. 48, fig. 18 (1906); BRUNER, Ann. Carnegie Mus., VII, pp. 115, 116 (1910).

Specimens of both sexes of a rather slender rugose-granulose grouse-locust coming from the Province del Sara, Bolivia, are referred to Bolivar's *Paratettix peruvianus*. They were taken at the same time and locality as the following insect, which has been determined as *Allotettix chapadensis* described by me (see ANNALS CAR. MUS., VII, p. 117). The present lot was taken by J. Steinbach. C. M. Acc. No. 5573.

9. *Allotettix chapadensis* Bruner.

Allotettix chapadensis BRUNER, Ann. Carnegie Mus., VII, pp. 115, 117 (1910).

All the specimens in the present collection, which are referred to this species, come from the Province del Sara, Bolivia. They were taken by J. Steinbach in October and December, and were found at an elevation of about 350 meters above sea-level. Both sexes are represented. C. M. Acc. No. 5058.

10. *Allotettix* sp.?

In addition to the three species of *Allotettix* recorded above there is a single male of what seems to be a fourth species at hand. It was taken at Las Juntas, in the Department of Santa Cruz, Bolivia, at an elevation of 250 meters above sea-level, in December, 1913, by J. Steinbach. C. M. Acc. No. 5060.

It is not as rugulose as is usually the case in representatives of the genus, but is instead remarkably coarsely granulose, and has the median carina of the pronotum quite prominent and of nearly equal height throughout. The vertex is also a little more advanced in front than is usual in representatives of this genus. I refrain, in view of the paucity of the material, from giving it a specific name.

Genus RYTINATETTIX Hancock.

Rytinatettix HANCOCK, Trans. Ent. Soc. Lond., 1908, p. 418 (1908); REHN, Trans. Amer. Ent. Soc., XLIII, p. 343.

As shown by Mr. Jas. A. G. Rehn (*l. c.*) Hancock created the genus *Rytinatettix* for the reception of the *Prototettix fossulatus* of Bolivar and the *Tetrix lobulata* of Stål, as well as the *Paratettix borellii* of Giglio-Tos.

11. *Rytinatettix fossulatus* Bolivar.

Prototettix fossulatus BOLIVAR, Ann. Soc. Ent. Belg., xxxi, pp. 255, 256 (1887); BRUNER, Ann. Carnegie Mus., VII, pp. 92, 122 (1910); REHN, Trans. Am. Ent. Soc., XLIII, p. 342 (1917).

Paratettix borellii GIGLIO-TOS. Boll. Mus. Zoöl. Anat. Comp. Torin., XII, no. 302 (1897), pp. 28-29; BRUNER, Locusts of Argentina, 1900, p. 16; *IB.*, Ann. Carnegie Mus., VII, p. 119 (1910); HANCOCK, Gen. Ins., Fasc. 48, Orth. Tetr., p. 56 (1906); REHN, Trans. Amer. Ent. Soc., XLIII, p. 343 (1910), footnote.

A single female specimen of a small robust grouse-locust, which was at first determined by me as *Paratettix borellii* of Giglio-Tos, seems to belong in the present genus as limited and defined by Hancock. Our specimen agrees fairly well with the descriptions of both *lobulatus* Stål and *fossulatus* Bolívar. But when compared with specimens of *Paratettix borellii* in my possession, coming from Argentina, I am inclined to choose Rehn's diagnosis as more nearly correct. The specimen is from the Province del Sara, Bolivia, where it was taken by J. Steinbach during the period from March to April, 1913, at a locality about 350 meters above sea-level. C. M. Acc. No. 5058.

12. *Rytinatettix affinis* sp. nov. (?)

A second specimen, a male, also apparently belonging to this genus, is at hand. It comes from the Rio Bermejo in the Province of Salta, Argentina, where it was taken at an elevation of 400 meters above sea-level. In general appearance it is much smoother and has longer wings and pronotum than the preceding insect. It may be called *Rytinatettix affinis*. It is dull ferruginous, or inclining to wood-brown, and faintly variegated with fuscous. The median carina of the pronotum is less prominent and only moderately undulate. Its measurements are as follows: Length of body, ♂, 6.5 mm.; of pronotum, 9 mm.; of posterior femora, 5 mm.; the wings extend 1 mm. beyond the apex of the pronotum. Collected by J. Steinbach, May, 1914.

Genus TETTIGIDEA Scudder.

Tettigidea SCUDDER, Bost. Journ. Nat. Hist., VIII (1862), p. 476; BOLIVAR, Ann. Soc. Ent. Belg., XXXI (1887), p. 299; HANCOCK, Gen. Ins., Fasc. 48, Orth. Tetr., p. 67 (1906); BRUNER, Ann. Carnegie Mus., VII, p. 123 (1910).

13. *Tettigidea glabrata* sp. nov.

A moderately large, but not excessively robust insect, having a nearly uniform dark fusco-brunneous color, the entire surface of which is glabrous, or, I might say, appearing to have been freshly varnished. Viewed laterally, the insect has a rather fusiform wedge shape, *i. e.*, the sides and edges of the wedge are somewhat arcuate or

gently bowed outward at middle. Apex of pronotum only reaching the tip of the hind femora. Wings not apparent or visible. Notwithstanding the glabrous appearance of this insect, it nevertheless has the surface of both the dorsum and lateral lobes of the pronotum very coarsely rugulose or wrinkled. On the disc two of these rugæ assume the form of supplemental, but rather irregular, longitudinal carinæ on each side of the middle, accompanied by many independent short and transverse carinæ, some of which unite with the longitudinal ones. Anterior margin of the pronotum both angulated and spined, the latter extending forward over the occiput to the middle of the eyes. Latter not prominent, sub-triangular in form, the front edge longest, the ventro- and dorso-posterior sides rounded and of about equal length. Occiput and summit of head somewhat, but not greatly, raised above the upper portion of the eyes, provided with a deep wide sulcus, which receives the pronotal spine from behind and the upper and backwardly directed portion of the frontal costa from the front. Frontal costa rather narrow and very narrowly sulcate; viewed from the side nearly straight and not greatly produced in front of the eyes. Antennæ missing. Anterior and middle legs slender; hind femora fairly robust, but elongate, provided with the usual rugæ, but these are somewhat irregular, especially on the disc. Hind tibiæ with the lateral edges acute and provided with many regularly arranged, rather acute, small spines. Labial palpi with two apical segments flattened and ivory-white. Under side of body and tibiæ piceous.

Length of body, ♀, 14 mm.; of pronotum, 13 mm.; of hind femora, 8 mm.

Habitat: The only specimen at hand, the type, comes from Oucatopi Island, where it was taken by S. M. Klages in June, 1918. C. M. Acc. No. 6178.

(*Note.*—Could this insect be the *Tetrix purpurascens* of Serville?)

14. *Tettigidea paratecta* Rehn?

Tettigidea paratecta REHN, Proc. Acad. Nat. Sci. Philad., May, 1913, pp. 304-306, figs. 10 and 11 (1913).

A single female specimen of the genus *Tettigidea*, from the Rio Japacani of eastern Bolivia, is referred here for the present at least. It was taken by J. Steinbach in February, 1915. C. M. Acc. No. 5573.

At first glance it seemed to be an immature individual of the following species, but this can hardly be the case, since it lacks the spine

on the anterior middle of the pronotum. It also has a more arcuate and deeper pronotum than the insect with which it has been compared.

15. *Tettigidea steinbachi* sp. nov.

A medium-sized long-winged species. Somewhat robust, but could not be termed incrassate. Smaller than *T. hancocki*, and more finely rugose or even granulose than that species; the supplemental longitudinal carinae of the disc three in number on each side, reaching a point a little beyond the basal fourth of the hind femora. Pronotum angulate in front, as well as provided with an acute spine, the apex of which reaches a point opposite (σ^7) the middle of the upper edges of the eyes, or a little in advance of this (♀). Frontal costa rather prominent and deeply sulcate, the sides or carinae not very heavy, and evenly converging upward. The apex a little advanced in front of the eyes and quite deeply and broadly sulcate, the upper extremity of the frontal costa almost reaching (♀), or not quite (σ^7) the apex of the anteriorly projecting spine of the pronotum. Posterior extremity of the latter reaching the tips of the hind femora, the wings somewhat longer. Hind femora rather robust at their base. Tibial spines quite large and regularly placed.

General color pale fuscous, the dorsum or disc of the male pronotum a little paler, and with the femora, the abdomen, and sides of the pronotum and head, varied with dull black or dark fuscous. Tegmina unicolorous or very faintly paler apically.

Length of body, σ^7 , 10 mm., ♀ , 11 mm.; of pronotum, σ^7 , 10.5 mm., ♀ , 12 mm.; of hind femora, σ^7 , 6 mm., ♀ , 7.5 mm.

Habitat: Province del Sara, Bolivia, 1 σ^7 , 1 ♀ , the types. Collected by J. Steinbach at an elevation of 350 meters above sea-level. The male was taken in February, 1913, and the female in October, 1912.

16. *Tettigidea costalis* Bruner.

Tettigidea costalis BRUNER, Ann. Carnegie Mus., VII, p. 133 (1910).

There is a single male specimen of this species before me. It comes from Las Juntas, Department of Santa Cruz, Bolivia, where it was taken in December, 1913, by J. Steinbach. It is much more robust than the same sex of *T. lateralis* of North America and has its hind femora prominently marked by a large median testaceous patch.

17. *Tettigidea multicostata* Bolivar.

Tettigidea multicostata BOLIVAR, Ann. Soc. Ent. Belg., XXXI, p. 299 (1887); BRUNER, Locusts of Argentina, 1900, p. 17; IB., Proc. U. S. Nat. Mus., XXX, p. 616 (1906); IB., Ann. Carnegie Mus., VII, p. 136 (1910); HANCOCK, Genera Ins., Fasc. 48, Orth. Tetr., p. 68 (1906).

A single female nymph belonging in this genus is referred here. It bears the label "Rio Bermejo, Prov. of Salta, Argentina, 400 m." It was collected by J. Steinbach in May, 1914.

Genus SCARIA Bolivar.

Scaria BOLIVAR, Ann. Soc. Ent. Belg., XXXI, p. 301 (1887); HANCOCK, Genera Ins., Fasc. 48, Orth. Tetr., p. 69 (1906); BRUNER, Ann. Carnegie Mus., VII, p. 140 (1910).

18. *Scaria hamata* (De Geer).

Acrydium hamatum DE GEER, Mém. Ins., III, p. 503 (1773), no. 22, pl. 42, fig. 13. *Tettix hamatus* STÅL, Recens. Orthopt., I, p. 146 (1873).

Scaria hamata BOLIVAR, Ann. Soc. Ent. Belg., XXXI, p. 301 (1887); HANCOCK, Gen. Ins., Orth., Acrid. Tetr., Fasc. 48, p. 69 (1906); BRUNER, Ann. Carnegie Mus., VII, p. 140 (1910).

A single male and three females of the genus *Scaria* are referred to this species. They come from the Mana River of French Guiana, where they were taken in May, 1917. C. M. Acc. No. 6008.

19. *Scaria producta* Hancock.

Scaria producta HANCOCK, Gen. Ins., Fasc. 48, Orth. Acrid., Tetr., p. 70 (1906); BRUNER, Ann. Carnegie Mus., VII, p. 140 (1910).

A female of this species collected by J. Steinbach on the Rio Japacani in eastern Bolivia, in February, 1915. C. M. Acc. No. 5573.

20. *Scaria boliviana* sp. nov.

Rather closely related to the *Acrydium hamatum* of De Geer, as shown by the flavo-maculate tegmina, but smaller, and lacking the depressed areas on the disc of the pronotum back of the shoulders. In color the present species is testaceo-fuscous varied with black on the sides, legs, and median carina of the pronotum. Moderately robust, finely granulose, the hind femora a little robust, not as long in proportion as in the species *producta*, a specimen of which latter is before me for comparison.

Length of body, ♀, 11.5 mm.; of pronotum, 13 mm.; of hind femora, 7 mm.

Habitat: The type, a female, comes from Las Juntas, Department of Santa Cruz, Bolivia, where it was taken in December, 1913, by J. Steinbach at an elevation of 250 meters above sea-level. A second specimen, also a female, bears the label "Quatro Ojos, Dept. Sta. Cruz, Bolivia, 300 m." It was likewise taken by Steinbach, but in November.

Genus *BATRACHIDEA* Serville.

Batrachidea SERVILLE, Hist. Nat. Ins. Orth., p. 764 (1839); BOLIVAR, Ann. Soc. Ent. Belg., XXXI, p. 126 (1887); BRUNER, Ann. Carnegie Mus., VII, p. 141 (1910). Not the genus *Batrachidea* as meant by Scudder, Thomas, or Saussure.

21. *Batrachidea mucronata* (Serville)?

Tetrix (*Batrachidea*) *mucronata* SERVILLE, Hist. Ins. Orth., p. 764 (1839).

Tetrix mucronata SERVILLE, Encycl. Méth., X, p. 600 (1839).

Acridium (*Tetrix*) *mucronatum* DE HAAN, Bijdrag. tot de Kennis Orthopt., p. 166 (1842).

Batrachidea mucronata BOLIVAR, Ann. Soc. Ent. Belg., XXXI, p. 300 (1887); HANCOCK, Genera Ins., Fasc. 48, Orth. Acrid., Tetr., p. 70 (1906); BRUNER, Ann. Carnegie Mus., VII, p. 141 (1910).

Two females from the Rio Japacani, eastern Bolivia, belong here. They were collected by J. Steinbach. C. M. Acc. No. 5573.

A single female specimen from Quatro Ojos, Department of Santa Cruz, Bolivia, taken by J. Steinbach in November, 1913, is also referred here, but with some doubt. Like the four specimens referred to in a former paper (ANNALS C. M., VII, p. 141) this insect has the frontal costa *widely*, rather than *narrowly* furcillate. All may represent a distinct species.

22. *Batrachidea notata* Hancock.

Batrachidea notata HANCOCK, in BRUNER, Proc. U. S. Nat. Mus., XXX, pp. 616-617 (1906); HANCOCK, Genera Ins., Fasc. 48, Orth. Acrid., Tetr., p. 70 (1906); BRUNER, Ann. Carnegie Mus., VII, p. 142 (1910).

A female of an insect, which appears to belong here, comes from Las Juntas, Department of Santa Cruz, Bolivia. It was taken by J. Steinbach at an altitude of 250 meters above sea-level in December, 1913. It has the pronotum a trifle shorter than to the apex of the hind femora, while the wings are still somewhat shorter.

Genus *PAUROTARSUS* Hancock.

Paurotarsus HANCOCK, Psyche, IX, p. 42 (1900); *IB.*, Gen. Ins., Fasc. 48, Orth. Acrid., Tetr., pp. 70-71 (1906); BRUNER, Ann. Carnegie Mus., VII, p. 142 (1910).

The representatives of the genus *Paurotarsus* are rather large insects for the group of locusts to which they belong, and bear a general resemblance to some of the species of *Tettigidea*. Three species have been recognized thus far. These may be separated by the annexed synoptic key:

- A. Carinae of the frontal costa very heavy, almost obliterating the otherwise moderately wide sulcus (Brazil).
- b.* Frontal costa strongly protuberant, the anterior margin of the frontal disc decidedly angulate, median carina depressed between the humeri; hind femora more elongate and slender; the caudal metatarsal joint less than a third longer than the distal joint (Brazil)...*insolitus* Rehn.
- bb.* Frontal costa only moderately protuberant, the anterior margin of the pronotum not decidedly angulate, the median carina between the humeri not noticeably depressed; hind femora more robust and less elongate; the caudal metatarsal joint fully twice as long as the distal joint.....*amazonus* Hancock.
- A.A. Carinae of the frontal costa only moderately heavy, leaving the sulcus fairly wide (Island of Trinidad).....*rugosus* Bruner.

23. *Paurotarsus amazonus* Hancock.

Paurotarsus amazonus HANCOCK, *l. c.*

2 ♀ ♀, Mana River, French Guiana, May, 1917, C. M. Acc. No. 6008.

Family EUMASTACID.E.

Genus EUMASTAX Burr.

Eumastax BURR, Essai sur les Eumastacides, pp. 43, 45 (1899); *IB.*, Gen. Ins., Fasc. 15, Orth. Eumastac., p. 15 (1903).

24. *Eumastax vittata* Burr.

Eumastax vittata BURR, Essai sur les Eumastacides, pp. 44, 46 (1899); KIRBY, Syn. Cat. Orthopt., III, p. 76 (1910).

A single male specimen of this species is at hand. It comes from Quatro Ojos, Department of Santa Cruz, Bolivia, where it was taken in November, 1913, at an elevation of 300 meters above sea-level by J. Steinbach. There are also two males and two females in the collections, which come from Buena Vista, eastern Bolivia, and were taken in February, 1915, by J. Steinbach. C. M. Acc. No. 5573.

25. *Eumastax tenuis* (Perty)?

Mastax tenuis PERTY, Delect. Anim. Brasil, p. 123, tab. XXIV, fig. 3 (1830).

Mastax virescens WESTWOOD, Arc. Ent., 1, p. 100 (1841).

ANN. CAR. MUS., XIII, 3, DEC. 4, 1920.

Mastax minuta BOLIVAR, An. Soc. Españ. Hist. Nat., X, p. 481 (1881).

Eumastax tenuis BURR, Essai sur les Eumastacides, pp. 44, 45 (1899); *IB.*, Gen. Ins., Fasc. 15, Orthop. Eumastac, p. 16 (1903).

Two females belonging to the genus *Eumastax* are referred to this species, even though they are a little small, as compared with the measurements given for it. They are from Buena Vista, eastern Bolivia, where they were collected by J. Steinbach, C. M. Acc. No. 5573.

26. *Eumastax militaris* (Gerstæcker)?

Mastax militaris GERSTÆCKER, Mitth. Neu-Vorpomm. u. Rügen, XIX, and XX, p. 84 (1888); KARSCH, Ent. Nachr., XV, p. 36 p. 36 (1889).

Eumastax militaris BURR, Essai sur les Eumastacides, pp. 44, 54 (1899); *IB.*, Gen. Ins., Fasc. 15, Orth. Eumast., p. 16 (1903).

Three female specimens taken in the month of May, 1917, bear the label "Mana River, Fr. Guiana." They were evidently collected by S. M. Klages, and belong to C. M. Acc. No. 6008. A fourth specimen, also a female, is from the Upper Rocana, N. Pará, Brazil. It was taken by the same collector in July, 1918, C. M. Acc. No. 6175.

These specimens are doubtfully referred to *militaris*, since they come from a region rather widely removed from the habitat given for the species.

Genus PARAMASTAX Burr.

Paramastax BURR, An. Soc. Españ., Hist. Nat., XXVIII, pp. 90, 94, 268 (1899); *IB.*, Gen. Ins., Fasc. 15, Orth. Eumastac., pp. 15, 16 (1903); BRUNER, Biol. Cent. Amer., Orth., II, pp. 20, 23 (1901); SAUSSURE, Rev. Suisse Zoöl., XI, p. 91 (1903); KIRBY, Syn. Cat. Orth., III, p. 77 (1910).

This is one of the larger genera of the family the species of which are wholly confined to tropical America and chiefly to South America. At least nine species have thus far been recognized, and a tenth is now added. They are all more or less gaudily colored, and may be separated by the accompanying synoptical table based on the males. It is a modification of the keys given by Burr and Saussure:

SYNOPSIS OF THE SPECIES OF PARAMASTAX.

A. Cerci of males forked.

b. Anterior and middle legs black. Wings cinnamon-brown.. *gaudens* Burr.

bb. Anterior and middle legs rufous.

c. Wings teneous or brassy, shining.

d. Hind femora rufous towards the apex. *vicina* Burr.

dd. Hind femora with their apex infusate, not rufous.

magna Giglio-Tos.

- cc. Wings hyaline-orange or cupreous. Anterior and middle legs rufous. *brevipennis* Burr.
- AA. Cerci of the males simple, not forked.
- b. Wings white. *nigra* Scudder.
- bb. Wings hyaline orange. Thorax and abdomen in part striped with yellow on the sides. Scutellum of the face flavomaculate.
- c. Cheeks immaculate.
- d. Eighth segment of the abdomen with its margin above two-spined. *lata* Gerst.
- dd. Eighth segment of the abdomen above emarginate, in the middle sinuose. *personata* Burr.
- cc. Cheeks and between the eyes ornamented with yellow.
- d. Front and cheeks with a transverse yellow band. Antennæ black. *teniata* Sauss.
- dd. Front and cheeks largely yellow. Base of antennæ yellow.
- e. Larger (σ^7 , 29 mm.; φ , 29 mm.). Antennæ largely rufous or vinaceous red, only at extreme apex infuscated. Front with its lower margin and a narrow arcuate transverse band below the antennæ black.
- pictifrons* sp. nov.
- ee. Smaller (σ^7 , 15 mm.). Antennæ, except basal segments, black. Front entirely yellow. *facialis* Sauss.

27. *Paramastax pictifrons* sp. nov.

Related to the species *P. teniata* and *P. facialis* of Saussure, but considerably larger than either. A beautiful insect, conspicuously ornamented with yellow and white on the head and sides of the meso- and metathorax.

General color of the male olivaceo-testaceous; the anterior and middle legs rufous; carinæ of the hind femora and spines of the hind tibiæ black; head on the occiput, hind and lower margins of the cheeks and lower edge of the front, together with the base of the clypeus, black, remainder yellow; antennæ with two basal joints yellow, remainder reddish, becoming infuscated apically. Sides of the abdomen and thorax back of the pronotum conspicuously banded with creamy white, this band placed between upper and lower infuscated borders, becoming gradually narrower toward its posterior end. Tegmina fuscous, their veins testaceous; wings slightly hyaline with a cupreous tinge basally. Apex of the hind femora rather lengthily infuscated. The general color of the female is a dark wood-brown with the sides of the meso- and metathorax and three basal abdominal segments conspicuously and broadly ornamented with a

longitudinal pallid stripe, bordered above and below by black, which gradually fades away into the general hue of the body. Face and cheeks paler than the remainder of the head and the body of the insect, but not yellow, as in the male. Antennæ and anterior and middle legs pale vinaceous red. Cerci of the male somewhat spatulate apically, rather strongly curved inward and downward; the hind margin of the eighth abdominal segment above widely and roundly emarginate, the sides of the emargination provided with a short coarse tooth.

Length of body, ♂, 20 mm., ♀, 29 mm.; of pronotum, ♀, 2.8 mm., ♀, 3.1 mm.; of tegmina, ♂, 14 mm., ♀, 15 mm.; of hind femora, ♂, 15 mm., ♀, 18 mm.

Habitat: The type, a male, comes from Las Juntas, Department of Santa Cruz, Bolivia, where it was taken in December, 1913. Two additional males and three females from the same locality are also at hand. They were all taken by J. Steinbach, and belong to C. M. Acc. No. 5060. There are also five males and two females before me from Buena Vista, and three males from Rio Japacani, eastern Bolivia. These also were collected by Steinbach, C. M. Acc. No. 5573.

28. *Paramastax nigra* Scudder.

Mastax nigra SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 266 (1875).

Eumastax nigra BURR, Essai sur les Eumastacides, p. 55 (1899); *IB.*, Gen. Ins., Fasc. 15, Orth. Eumast., p. 16 (1903).

Three males of a species belonging to *Paramastax* are referred to Scudder's *nigra*. They come from the Rio Japacani in eastern Bolivia, where they were collected in February, 1915. C. M. Acc. No. 5573.

These specimens vary somewhat from Scudder's description, but possibly only owing to the condition of preservation, etc.

Genus MASYNTES Karsch.

Masyntes KARSCH, Ent. Nachr., XV, pp. 26, 31 (1889); BURR, Soc. Españ., Hist. Nat., XXVIII, pp. 90, 95, 273 (1899); SAUSSURE, Rev. Suisse Zool., XI, p. 99 (1903); BRUNER, Ann. Carnegie Mus., VIII, p. 6 (1910).

29. *Masyntes borellii* Giglio-Tos.

Masyntes borellii GIGLIO-TOS, Boll. Mus. Zool. Anat. Comp. Torino, XII, No. 302, p. 17 (1898); BURR, An. Soc. Españ., Hist. Nat., XXVIII, pp. 90, 274, 275 (1899); REHN, Proc. Acad. Nat. Sci. Philad., LIV, p. 67 (1905); KIRBY, Syn. Cat. Orth., III, p. 79 (1910).

Masyntes mutilata GIGLIO-TOS (*nec* SERVILLE). Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 4 (1894); *IB.*, Zoöl. Jahrb. Syst., VIII, p. 806 (1895).
Masyntes chapadensis BRUNER, Ann. Carnegie Mus., VIII, pp. 6, 8 (1911).

A single male nymph from Province del Sara, Bolivia, is referred to this species. It was collected by J. Steinbach in February, 1913, at an elevation of 350 meters above sea-level.

According to Candido Bolivar the above synonymy should stand (Bol. Real. Soc. Españ., Hist. Nat., XVI, 1916, p. 198). Accordingly I also am temporarily placing in this species two other male specimens, which I had set aside as possibly representing two new species, related to *M. brasiliensis* and *M. tigris*, on account of their abbreviated tegmina and wings. The names suggested were *M. fuscipennis* and *M. steinbachi* respectively, the former being 23 mm. in length with tegmina and wings 7.5-8 mm. long, and the latter 22 mm. in length with tegmina 3.5 mm. long. Both insects have the hind femora twice broadly annulate with testaceous on their apical two-fifths, although much brighter and more strongly defined in *fuscipennis*. Both have fuscous antennæ with the three basal joints pale. The general color of *fuscipennis* above is dark fuscous, without bands of testaceous mottlings. The specimen labelled *steinbachi* is pale brown with longitudinal fuscous bands on the sides of the pronotum. Under side and legs of both insects flavo-testaceous, brightest in *fuscipennis*.

The specimen labelled *fuscipennis* is ticketed "Pr. Chiquitos, Bolivia, 300 M., Steinbach," "April 1909," and "Carn. Mus. Acc. 5229"; the specimen labelled *steinbachi* is ticketed "R. Japacani, E. Bolivia, J. Steinbach," "Feb. 1915," and "Carn. Mus. Acc. 5573."

Family PROSCOPIDÆ.

For remarks on the present family of tropical American locusts please refer to what the writer had to say in a former number of the ANNALS (Vol. VII, pp. 430-431, 1913), where he reported upon a number of forms contained in the Carnegie Museum. The present collection contains but few representatives of this family.

Genus PROSCOPIA Klug.

Proscopia KLUG, Hor. Phys. Berol., p. 17 (1820); ST. FARG. & SERVILLE, Encycl. Meth., Ins., X, p. 211 (1825); SERVILLE, Ann. Sci. Nat., XXII, p. 265 (1831); *IB.*, Ins. Orth., p. 571 (1839); BURMEISTER, Handb. Ent., II, pp. 602, 603 (1838); BRUNNER VON WATTENWYL, Verh. Zoöl.-bot. Ges. Wien., XL, pp. 92, 94 (1890); and others.

The species of this genus seem to be less numerous than are those of some other genera. They may be recognized by the characters given by Brunner von Wattenwyl in his Monograph of the family mentioned above.

30. *Proscopia scabra* Klug.

Proscopia scabra KLUG, *l. c.*, p. 19, no. 2, pl. 3, fig. 2 (1820); BURMEISTER, *l. c.*, p. 604, no. 7 (1839); SERVILLE, *l. c.*, p. 574 (1839); BRUNNER, *l. c.*, pp. 95, 97, no. 5 (1890); REHN, Proc. Acad. Nat. Sci. Philad., 1918, p. 168.

♂. *Proscopia rostrata* KLUG, *l. c.*, p. 24, no. 12, pl. 4, fig. 12 (1820), etc.

Proscopia parallela WALKER, Cat. Derm. Salt. B. M., III, p. 490 (1870).

Taxiarchus paraënsis REHN, Ent. News, XVII, p. 332 (1906).

This species is represented by a male and a female from Cayenne, French Guiana, where they were collected by S. M. Klages in March and April, 1917; C. M. Acc. No. 5873. There is a second male at hand, taken at Benevides, Pará, Brazil, by the same collector in October, 1918; C. M. Acc. No. 6174. This last-mentioned specimen agrees with the one reported upon by Rehn as to color-markings.

Genus TETANORHYNCHUS Brunner.

Tetanorhynchus BRUNNER V. WATTENWYL, Verh. Zoöl.-Bot. Ges. in Wien, XXXIX, pp. 92, 104 (1890); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 302, p. 18 (1897); REHN, Proc. Acad. Nat. Sci. Phil., 1904, p. 677; BRUNER, Ann. Carnegie Mus., VIII, p. 433 (1913).

31. *Tetanorhynchus humilis* Giglio-Tos?

Tetanorhynchus humilis GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 302, p. 18 (1897); KIRBY, Syn. Cat. Orthopt., III, p. 86 (1910); BRUNER, Ann. Carnegie Mus., VIII, pp. 435-436 (1913).

Three males, two females, and one nymph from the Province del Sara, Bolivia, are placed here with a question. They do not quite agree with the description given by Giglio-Tos, but approach it closer than anything else. They were taken by J. Steinbach in February, November, and December. A pair were taken *in coitu*. C. M. Acc. No. 5573.

32. *Tetanorhynchus incertus* Brunner?

Tetanorhynchus incertus BRUNNER, Verh. Zoöl.-Bot. Ges. Wien, XL, pp. 105-106 (1890); KIRBY, Syn. Cat. Orthopt., III, p. 86 (1910); BRUNER, Ann. Carnegie Mus., VIII, pp. 437, 439 (1913).

There is a single female specimen at hand, which seems to belong here. It is from Las Juntas, Department of Santa Cruz, Bolivia, 250 meters above sea-level. It was collected by J. Steinbach in December, 1913.

33. *Tetanorhynchus borellii* Giglio-Tos.

Tetanorhynchus borellii GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 302, p. 18 (1897); KIRBY, Syn. Cat. Orth., III, p. 86 (1910).

Four males and two females of a third species of this genus appear to be referable to *T. borellii*. They come from the Rio Bermejo, Province of Salta, Argentina. They were collected at an elevation above sea-level of 400 m., in May, 1914, by J. Steinbach. C. M. Acc. No. 5229.

Genus CEPHALOCÆMA Serville.

Cephalocæma SERVILLE, Ins. Orth., p. 577 (1839); BURM, Abh. Ges. Halle, XV, p. 3 (1880); BRUNNER, Verh. Zoöl.-Bot. Ges. Wien, XL, pp. 93, 114 (1890); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 302, pp. 19-20 (1894); BRUNER, Ann. Carnegie Mus., VIII, pp. 439-440 (1913).

For an account of the genus see some remarks by me in the ANNALS for 1913, page 140.

34. *Cephalocæma teretiuscula* Brunner.

Cephalocæma teretiuscula BRUNNER, l. c., pp. 115, 117, no. 6 (1890); GIGLIO-TOS, Boll. Mus. Torino, XII, no. 302, p. 20 (1897).

A male Proscopiid from Buena Vista, eastern Bolivia, is referred here. It was taken by J. Steinbach. C. M. Acc. No. 5573.

Family TRUXALIDÆ.

While the family comprising the truxaline locusts is rather extensive and variable, with an almost world-wide distribution, the present collection does not contain an unusually large number of species. Aside from two or three very common forms, only a few are represented by more than two or three individuals each. The family as a whole, so far as South American forms is concerned, was somewhat fully discussed in these ANNALS (Vol. VIII, pp. 442-456) where a synoptical key for the separation of the thirty or more genera was included. Since the publication of that paper the results of studies by Mr. James A. G. Rehn, tend to somewhat modify the accepted

status of some of the representatives of the family, but not to the extent of rendering that paper useless.

Genus TRUXALIS Fabricius.

Truxalis FABRICIUS, Syst. Ent., p. 279 (1775); STÅL, Recens. Orth., I, pp. 92, 104 (1873) and many writers since.

35. *Truxalis brevicornis* (Linnæus).

Gryllus brevicornis LINN., Cent. Ins. Rar., p. 15 (1763); *IB.*, Amœn. Acad., VI, p. 398, n. 37 (1764).

For a quite full synonymy of this species see ANNALS CARNEGIE MUSEUM, Vol. VIII, p. 9 (1911), and for the principal bibliography see Kirby's Syn. Cat. Orth., III, p. 103.

The present collection contains specimens from the following named localities; two males and 1 female, Cayenne, French Guiana, Feb. and Mch., 1917; one male, Upper Rocana, N. Pará, Brazil, July, 1918, S. M. Klages; two males, Benevides, Pará, Brazil, Oct., 1918. These different lots belong to the C. M. Acc. Nos. 5873, 6174, and 6175, respectively.

Genus EUTRYXALIS Bruner.

Eutryxalis BRUNER, 2nd Rep. Locust Comm. B. Aires, pp. 22, 24 (1900); *IB.*, Proc. U. S. Nat. Mus., XXX, pp. 621, 625 (1906).

36. *Eutryxalis gracilis* (Giglio-Tos).

Hyalopteryx gracilis GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, No. 302, p. 22 (1887).

Eutryxalis gracilis BRUNER, Proc. U. S. Nat. Mus., XXX, pp. 623, 625 (1906).

Two specimens, male and female, are at hand. They were collected by Mr. J. Steinbach in the Province del Sara, Bolivia, in November and December.

Genus PARATRUXALIS Rehn.

Paratruxalis REHN, Trans. Am. Ent. Soc., XLII, pp. 275-276 (1916).

Orphula GIGLIO-TOS, BRUNER, REHN, CAUDELL, etc. during recent years (not of Stål, *teste* Rehn).

According to Rehn, *l. c.* there has been an error on the part of various recent writers as to the identity of Stål's genus *Orphula*, and he has suggested the substitution of the name *Paratruxalis* to take its place where misused.

37. *Paratruxalis filatus* (Walker).

Chrysochraon filatus WALKER, Cat. Derm. Salt. Brit. Mus., V, p. 785 (1870).

Paratruxalis filatus REHN, l. c., p. 276 (1916).

Orphula pagana GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 9 (1894) *et al* (*nec* Stål).

The specimens before me, four males and four females, which I locate here, are from Quatro Ojos, Department of Santa Cruz, Province del Sara, Bolivia, and from the Rio Bermejo, Province of Salta, Argentina. They are all slightly larger than those coming from Asunción, Paraguay, and first determined by me as Stål's *Orphula pagana*. They may represent Giglio-Tos' *Orphula minor*, as suggested by Rehn (Proc. Acad. Nat. Sci., Philad., 1906, p. 17). If so, they are very closely related to *pagana*, which as shown by Rehn (Trans. Am. Ent. Soc., XLII, pp. 175-176, 1916) is the same as Walker's earlier described *Chrysochraon filatus*, of which it becomes a synonym. These specimens were collected by J. Steinbach in March and April, 1913, and May, 1914.

38. *Paratruxalis filatus minor* (Giglio-Tos)?

For synonymy, etc., see Rehn, l. c., pp. 175-176.

Four females coming from the Province del Sara, Bolivia, may belong here. They were taken during the period January-April, 1913, by Steinbach, and form a part of C. M. Acc. No. 5058.

Genus ORPHULELLA Giglio-Tos.

Orphulella GIGLIO-TOS, Bol. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, pp. 8, 10 (1894); BRUNER, Ann. Carnegie Mus., VIII, pp. 9-20 (1911).

The paper cited in the last reference contains a general statement concerning the genus and also a synoptic table of the South American species.

39. *Orphulella gracilis* Giglio-Tos.

Orphulella gracilis GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 11 (1894); BRUNER, Ann. Carnegie Mus., VIII, p. 11, 14 (1911).

Among the material collected by J. Steinbach in the Province del Sara, Bolivia, are four males and one female, which are referred to this species. They were taken in the months of February, March, April, and December at an approximate altitude above sea-level of 350 meters.

40. *Orphulella pelidna* (Burmeister).

Gomphocerus pelidnus BURMEISTER, Handb. Ent., II, p. 659 (1838). For further synonymy see Kirby, Syn. Cat. Orth., III, p. 120 (1910).

A number of specimens of both sexes, as well as nymphs of a member of this genus from Nueva Gerona, Columbia, and Sante Fé, Isle of Pines, West Indies, are referred here. They were chiefly taken in the months of June, July, and August. C. M. Acc. No. 4745.

41. *Orphulella peruna* Bruner.

Orphulella peruna BRUNER, Ann. Carnegie Mus., VIII, pp. 12, 16 (1911).
Zonocerus bilineatus SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 268 (1874).
Orphulella ? *bilineatus* SCUDDER, l. c., XXVII, p. 210 (1896). Not *Stenobothrus bilineatus* Scudder, Bost. Journ. Nat. Hist., VII, p. 250 (1862).

This species is represented by a pair from the Upper Mamoré River, two pairs from Las Juntas, and a single female from Quatro Ojos, all in the Department of Santa Cruz, Bolivia, collected by J. Steinbach in November and December.

42. *Orphulella punctata* (De Geer).

Acridium punctatum DE GEER, Mém. Ins., III, p. 593, pl. 42, fig. 12 (1773).
Truxalis punctata STÅL, Recens Orth., I, p. 106 (1873).
Orphulella punctata GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 12 (1894); BRUNER, Ann. Carnegie Museum, VIII, pp. 11, 15 (1911).

For a rather full synonymy of this species see Kirby, Syn. Cat. Orth., III, p. 121 (1910).

There are a number of specimens at hand of both sexes. They are from Cayenne, French Guiana, where they were taken during the months of February, March, and April by S. M. Klages. Both green or pale and dusky individuals are represented. C. M. Acc. No. 5873.

43. *Orphulella boucardi* (Bruner).

Linoceratium boucardi BRUNER, Biol. Cent. Amer., Orth., II, p. 84 (1904).
Orphulella chipmani BRUNER, Journ. N. Y. Ent. Soc., XIV, p. 149 (1906).
Linoceratium australe BRUNER, Ann. Carnegie Mus., VIII, p. 20 (1911).

For a discussion of the synonymy of the present species see James A. G. Rehn in the Transactions of the American Entomological Society, XLII, p. 277.

Specimens of this insect are at hand from Cayenne, French Guiana, taken in February and March, 1917. They belong to C. M. Acc.

Nos. 5873 and 5893; from Benevides, Pará, Brazil, taken October, 1918, C. M. Acc. No. 6174; and from the Mana River, French Guiana, May, 1917, C. M. Acc. No. 6008. They were all taken by S. M. Klages.

This material, although somewhat variable, agrees quite well with the original specimens, upon which the species was based. In color both green or greenish, and brown or fuscous specimens are included.

44. *Orphulella scudderi* (Bolivar)?

Orphula scudderi BOLIVAR, Mém. Soc. Zoöl. France, I, p. 142 (1888).

Orphulella scudderi BRUNER, Biol. Cent. Amer., Orth., II, pp. 77, 82 (1904); *IB.*, Ann. Carnegie Mus., VIII, pp. 12, 17 (1911).

There is a single female specimen belonging to the genus *Orphulella* at hand, which I at first felt inclined to call new, giving it the name *O. surinama*. After considering the matter somewhat in detail it is doubtfully referred to *O. scudderi* Bolivar, originally described from Cuba, although it varies considerably from the original description of that insect. It bears the label "Cayenne, Mch. 1917, Acc. 5897."

Genus PARACHLOËBATA Bruner.

Parachloëbata BRUNER, Biol. Cent.-Amer., II, pp. 31, 86 (1902, 1904); KIRBY, Syn. Cat. Orth., III, p. 124 (1910).

The present genus was originally based on a single specimen coming from the West Indies. In general appearance this insect is very similar to the *Orphulella*, but differs from them in having three more spines on the outer margin of the hind tibiae and in the color-pattern. It is also likewise more robust in stature.

45. *Parachloëbata pratensis* Bruner.

Parachloëbata pratensis SAUSSURE (*MS. name*); BRUNER, Biol. Cent.-Amer., Orth., II, p. 84, Pl. I, figs. 10, 10a, ♀ (1904); KIRBY, *l. c.*, p. 124 (1910).

The present collection contains several specimens of both sexes as well as a half dozen nymphs. They come from Nueva Gerona, Santa Fé, and Columbia, Isle of Pines, and belong to C. M. Acc. No. 4745.

In the original description of the species only the female was characterized. It is now possible to add something relative to the male. While the females vary greatly in color from almost a uniform pale grass-green with scarcely a trace of dark and pallid markings, as

originally described, to even in part vinaceous, all of the males at hand (5) are fairly uniformly colored, being greenish testaceous on the head, body, and legs. Cheeks back of the eyes, upper edges of the lateral lobes of the pronotum and the pleura fuscous; the tegmina, except the dorsal field, which is pallid, quite uniformly infuscated. The occiput, disc of the pronotum, and the dorsal area of the tegmina seem invariably to be pallid. The genicular portion of the hind femora in the males appear to be much less infuscated than in the opposite sex, where it is usually quite dark.

The following measurements can now be given: Length of body, ♂, 19 mm., ♀, 27 mm.; of pronotum, ♂, 3.3 mm., ♀, 5 mm.; of tegmina, ♂, 14 mm., ♀, 21 mm.; of hind femora, ♂, 11 mm., ♀, 15.5 mm.

Genus DICHROMORPHA Morse.

Dichromorpha MORSE, Psyche, VII, p. 326 (1896); BRUNER, Biol. Cent.-Amer., Orth., II, pp. 31, 85 (1902, 1904); IB., Second Rept. Locust. Com. B. Aires, p. 28 (1900); IB., Ann. Carnegie Mus., VIII, pp. 444, 449 (1911).

The representatives of the genus *Dichromorpha* all belong to the Western Hemisphere, where they are to be met with at suitable localities between, the 50th parallel north, and about the 40th parallel south.

46. *Dichromorpha australis* Bruner.

Dichromorpha australis BRUNER, Locusts of Argent., p. 29 (1900); IB., Ann. Carnegie Mus., VIII, p. 449 (1911).

Dichromorpha viridis GIGLIO-TOS (*nec* Scudder), Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 302, p. 24 (1897).

A single male specimen coming from the Rio Japacani in eastern Bolivia is among the material collected by J. Steinbach in February, 1915. C. M. Acc. No. 5573.

Nearly all of the specimens of this species are pale testaceous, rather than green, the prevailing color of our North American *D. viridis*. In *D. australis* a much larger percentage of the individuals are also brachypterous than is the case in *D. viridis*.

Genus FENESTRA Giglio-Tos.

Fenestra GIGLIO-TOS, Zoöl. Jahrb., Syst. Abth., VIII, p. 807 (1895); REHN, Proc. Acad. Nat. Sci. Phil., 1906, p. 31.

Dichroaettix BRUNER, 2nd Rept. B. Aires Locust Comm., pp. 22, 32 (1900).

Not = Fenestra BRUNNER VON WATTENWYL, Revis. Syst. Orth., p. 120 (1893), which evidently was based on a species of Rehn's genus *Cocytotettix*. (See discussion by Rehn in footnote No. 12, p. 30, Proc. Acad. Nat. Sci. Phil., 1906.)

47. *Fenestra bohlsii* Giglio-Tos.

Fenestra bohlsii GIGLIO-TOS, Zoöl. Jahrb., Syst. Abth., VIII, p. 807 (1895); REHN, *l. c.*, p. 32 (1906).

The material collected by Steinbach in March and April, 1913, contains a single female from the Province del Sara, Bolivia, which I refer here. It was taken at an altitude of 350 meters above sea-level. There are also at hand two males coming from Buena Vista, and one from the Rio Japacani of eastern Bolivia. The latter specimen was taken in February, 1915. All these males were collected by J. Steinbach. C. M. Acc. No. 5573.

Genus PERUVIA Scudder.

Peruvia SCUDDER, Psyche, V, p. 439 (Dec. 1890); REHN, Trans. Amer. Ent. Soc., XLII, p. 280 (1916).

Toxopterus BOLIVAR (*nec* Koch), Anal. Soc. Esp. Hist. Nat., XIX, p. 313 (1890).

The present genus unfortunately has had a checkered career, as may be seen by referring to the synonymy under the species *Peruvia nigromarginata* Scudder, which follows. Mr. Jas. A. G. Rehn has discussed the synonymy rather carefully (*l. c.*, pp. 280, 281).

48. *Peruvia nigromarginata* (Scudder).

Machrocera nigromarginata SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 268 (1875).

Peruvia nigromarginata SCUDDER, Psyche, V, p. 439 (Dec. 1890); REHN, Trans. Amer. Ent. Soc., XLII, p. 280 (1916).

Toxopterus miniatus BOLIVAR, Anal. Soc. Esp. Hist. Nat., XIX, p. 314 (Feb. 1891).

While the present material does not happen to contain representatives of this insect, it is a denizen of eastern Bolivia so frequently referred to in these pages, and from which the Carnegie Museum contains specimens, there collected.

Genus AMBLYTROPIDIA Stål.

Amblytropidia STÅL, Recens. Orth., I, pp. 93, 107 (1873); BRUNER, Ann. Carnegie Mus., VIII, p. 24 (1911). For a more complete bibliography see Kirby, Syn. Cat. Orth., III, p. 114 (1910).

49. *Amblytropidia corumbæ* Bruner.

Amblytropidia corumbæ BRUNER, Ann. Carnegie Mus., VIII, pp. 25, 28 (1911).

There certainly is in the material from the Province del Sara, Bolivia, one female, and possibly three others belonging here. They were



collected by J. Steinbach in October and December. One of these three, taken in December, differs quite noticeably from the others in not only having the tegmina destitute of the pale sub-costal line, but also quite uniformly rather prominently conspersed with fuscous. Otherwise they agree fairly well with *A. corumbæ*.

50. *Amblytropidia chapadensis* Rehn.

Amblytropidia chapadensis REHN, Proc. U. S. Nat. Mus., XXX, p. 371 (1906); BRUNER, Ann. Carnegie Mus., VIII, pp. 25, 29, 451 (1911, 1913).

Only a single male specimen among the present lot of orthopterous insects is referable to *A. chapadensis*. It is from Buena Vista, eastern Bolivia, where it was taken by J. Steinbach. C. M. Acc. No. 5573.

51. *Amblytropidia trinitatis* Bruner.

Amblytropidia trinitatis BRUNER, Biol. Cent.-Amer., Orth., II, p. 65 (1904); *IB.*, Proc. U. S. Nat. Mus., XXX, p. 630 (1906); *IB.*, Ann. Carnegie Mus., VIII, p. 25 (1911).

I now have before me five males and three females of this interesting little species, little, at least so far as the male is concerned. They come from Cayenne, French Guiana, where they were taken in January, February, and March, 1917, by S. M. Klages. C. M. Acc. No. 5873.

This insect is interesting from the fact that the males have the basal half of the wings very noticeably tinted with a delicate rose-pink. In the females this tint is scarcely visible, except at the very base, where it is confined to the anterior margin.

52. *Amblytropidia robusta* Bruner.

Amblytropidia robusta BRUNER, Proc. U. S. Nat. Mus., XXX, p. 371 (1906); *IB.*, Ann. Carnegie Mus., VIII, pp. 25, 28 (1911).

A pair, male and female, taken by J. Steinbach at Buena Vista, eastern Bolivia, are here referable. C. M. Acc. No. 5573.

Genus BORELLIA Rehn.

Borellia REHN, Proc. U. S. Nat. Mus., XXX, p. 379 (1906); BRUNER, Ann. Carnegie Mus., VIII, pp. 34 (1911), 446 (1913).

53. *Borellia carinata* Rehn.

Borellia carinata REHN, *l. c.*, p. 379 (1906); BRUNER, Ann. Carnegie Mus., VIII, p. 34 (1911).

Only a single male specimen coming from the Province del Saral Bolivia is referred here. It was collected by Steinbach at an elevation of 450 meters above sea-level. It is quite typical, and agrees well, with the large series examined by me and reported upon in a previous paper appearing in the ANNALS, Vol. VIII, p. 34.

Genus STAUORHECTUS Giglio-Tos.

Staurorhectus GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp., XII, no. 302, p. 25 (1897); BRUNER, Ann. Carnegie Mus., VIII, p. 31 (1911).

54. *Staurorhectus longicornis* Giglio-Tos.

Staurorhectus longicornis GIGLIO-TOS, l. c., p. 26 (1907); BRUNER, l. c., p. 31 (1911).

The collection contains three specimens of this locust, two males from the Province del Sara, Bolivia, and a female, the latter from the Rio Bermejo, Province of Salta, Argentina. They were taken in February, March, and April by J. Steinbach.

While the males of this species are quite uniform as to color, the females are apt to vary greatly in this respect.

Genus COMPSACRIS Bolivar.

Compsacris BOLIVAR, Anal. Soc. Españ. Hist. Nat., XIX, p. 315 (1890); REHN, Trans. Amer. Ent. Soc., XLII, p. 279 (1906); BRUNER, Ann. Carnegie Mus., VIII, p. 445 (1913).

This genus comes near to *Staurorhectus* Giglio-Tos, but is distinct. It belongs to the region of the upper Amazons in eastern Bolivia and southwestern Brazil.

55. *Compsacris pulcher* Bolivar.

Compsacris pulcher BOLIVAR, l. c., p. 315 (1890); REHN, Trans. Amer. Ent. Soc., XLII, p. 279 (1916).

Staurorhectus intermedius BRUNER, Ann. Carnegie Mus., VIII, p. 31 (1911).

The present collection contains two males and a female of this species. They come from Benevides, Pará, Brazil, where they were taken by S. M. Klages in October, 1918. C. M. Acc. No. 6174.

The males and females of this insect agree with the female of my *Amblyscapheus lineatus* from Paraguay in having the apical joints of the antennæ white or pallid; but the valves of the ovipositor are very unlike those of *A. lineatus*.

Genus *ALOTA* Bruner.

Alota BRUNER, Ann. Carnegie Mus., VIII, pp. 446, 454 (1911).

The genus *Alota* was established by the present writer on the strength of a single male specimen from the Rio Machupo in Bolivia. It belongs to the group *Scylliniæ* as shown by the size and form of the inner hind tibial spurs.

56. *Alota boliviana* Bruner.

Alota boliviana BRUNER, l. c., p. 454 (1911).

This species was described, as stated above, from a single male specimen.

We now have a female which also belongs here. It was taken by J. Steinbach at Las Juntas, in the Department of Santa Cruz, Bolivia, in December, 1913, at an altitude of 250 M. above sea-level. C. M. Acc. No. 5060.

This specimen in its type of coloration and general appearance at first glance recalls one of the larger species of *Orphulella*, and also of the representatives of the genus *Parorphula*. However, the entire absence of lateral pronotal carinæ and the structure of the tibial spurs at once carry it to *Alota* in the synoptic table of the South American genera of the Truxalidæ. The tegmina have the costal and discal fields infuscated, the former varied with a series of pale spots, which give to that area a longitudinal maculate appearance. This female specimen has but six spines on the outer margin of the hind tibiæ instead of seven, as described for the male type. Still I feel satisfied that it belongs to the species *boliviana*.

Length of body, ♀, 19 mm.; of pronotum, 3.85 mm.; of tegmina, 19 mm.; of hind femora, 12 mm.

Genus *SCYLLINA* Stål.

Scyllina STÅL, Recens. Orth., I, pp. 94, 112 (1873). For further synonymy see Annals VIII, p. 35 (1811).

This is certainly an important genus in tropical American countries, where its representatives are widely distributed and among the most abundant of locusts. Some of them even become destructive to crops and forage-plants in their respective localities.

57. *Scyllina brunneri* (Giglio-Tos).

Pseudostauronotus brunneri GIGLIO-TOS, Zool. Jahrb., Syst., VIII, p. 800 (1895).

Plectorotettix brunneri BRUNER, Biol. Cent.-Amer., Orth., II, p. 100 (1904); *IB.*, Proc. U. S. Nat. Mus., XXX, p. 636 (1906).

Scyllina brunneri REHN, Proc. U. S. Nat. Mus., XXX, p. 385 (1906).

The only specimen at hand which is referable to Giglio-Tos's *brunneri* is a male taken at a point in the Province del Sara, Bolivia, at an elevation of 350 m. above sea-level. It was collected by J. Steinbach in November, 1913.

58. *Scyllina smithi* Rehn?

Scyllina smithi REHN, Proc. U. S. Nat. Mus., XXX, pp. 387-388 (1906); BRUNER, Ann. Carnegie Mus., VIII, p. 36 (1911).

There are six males and six females in the collection, which are with some doubt referred to Rehn's *S. smithi*. They were collected by J. Steinbach in the Province del Sara, Bolivia, in October and November, 1913.

59. *Scyllina borellii* Giglio-Tos?

Scyllina borellii GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 14 (1894).

Mr. Steinbach took a remarkably large male *Scyllina* in the Province del Sara, which I am inclined to refer to *S. borellii* of Giglio-Tos, only the female of which was described. Rehn later described his female *S. schistocercoides*, which is also very large, but not any larger than the present specimen. Rehn's specimen was rather slender, while that of Steinbach's collecting is comparatively robust.

The present specimen was found at an elevation of 350 meters above sea-level. It measures; Length of body, 37 mm.; of pronotum, 7 mm.; of tegmina, 37 mm.; of hind femora, 25 mm.

60. *Scyllina cyanipes* (Fabricius)?

Gryllus cyanipes FABRICIUS, Syst. Ent., p. 292, no. 25 (1775).

Scyllina cyanipes KIRBY, Syn. Cat. Orth., III, p. 132 (1910).

One male and two females of an insect belonging to *Scyllina* and coming from Cayenne, French Guiana, are referred here with some hesitation. They were collected in the month of February, 1917, and are included in C. M. Acc. No. 5873.

61. *Scyllina pratensis* (Bruner)?

Plectrolettix pratensis BRUNER, Biol. Cent.-Amer., Orth., II, p. 100 (1904).

Scyllina pratensis REHN, Proc. Acad. Nat. Sci., LVIII, p. 45 (1906).

A single male *Scyllina* coming from the Rio Japacani of eastern ANN. CAR. MUS., XIII, 4, DEC. 4, 1920.

Bolivia is referred with some doubt to this species, because of its being taken so far from the given habitat of the species, and because no specimens of *pratensis* are at hand for comparison. The insect was taken by J. Steinbach in February, 1915. C. M. Acc. No. 5873.

62. *Scyllina brasiliensis* (Bruner).

Plectrolettix brasiliensis BRUNER, Biol. Cent.-Amer., Orth., II, p. 100 (1904).

Scyllina brasiliensis REHN, l. c., p. 46 (1906).

Four males and three females of a second *Scyllina* coming from Cayenne in French Guiana are referred here. These were collected in February and March, 1917. C. M. Acc. Nos. 5873 and 5897.

Family GEDIPODIDÆ.

Genus CHORTOPHAGA Saussure.

Chortophaga SAUSSURE, Mém. Soc. Gèneve, XXVIII (9), pp. 43, 72 (1884). For further synonymy see KIRBY, Syn. Cat. Orth., III, p. 198.

63. *Chortophaga cubensis* (Scudder).

Tragocephala cubensis SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, pp. 480, 483 (1875).

Chortophaga cubensis SAUSSURE, Mém. Soc. Gèneve, XXVIII (9), pp. 72, 73 (1884), etc.

There are four females of this species before me. They form part of C. M. Acc. No. 4798, and were collected at Los Indios and Nueva Gerona on the Isle of Pines.

Genus PSINIDIA Stål.

Psinidia STÅL, Recens. Orth., I, pp. 117, 133 (1873). For a rather extended synonymy see KIRBY, Syn. Cat. Orth., III, p. 246 (1910).

64. *Psinidia fenestralis* (Serville).

Edipoda fenestralis SERVILLE, Ins. Orth., p. 726 (1838); THOMAS, Synopsis Acrid. N. Amer., pp. 109, 118 (1873).

Psinidia fenestralis STÅL, l. c., p. 133 (1873).

This rather common Gdipodid is represented by one male, two females and two nymphs. They come from Los Indios and Nueva Gerona, Isle of Pines.

This same species is quite widely distributed on the North American continent, and occurs with both red and yellow hind-wings. It is

an insect of the seashore and sandy beaches of inland waters, extending even into Canadian territory to the north of the United States and southward into Mexico.

Genus SPHINGONOTUS Fieber.

Sphingonotus FIEBER, Lotus, III, p. 124 (1853); SAUSSURE, Mém. Soc. Genève, XXVIII, pp. 60, 195 (1884). For a more complete synonymy see KIRBY, Syn. Cat. Orth., III, p. 271 (1910).

65. *Sphingonotus cærulans cubensis* Saussure.

Sphingonotus cærulans var. *cubensis* SAUSSURE, Prodróm. Œdip., p. 201 (1884); REHN, 2nd Rept. Cent. Exp. Sta. Cuba, p. 204 (1909).

A single male specimen of this West Indian variety of the European *S. cærulans* is at hand. It comes from Nueva Gerona, Isle of Pines. It was taken on August 10, 1912, and forms a part of C. M. Acc. No. 4745.

Family OMMEXECHIDÆ.

Genus OMMEXECHA Serville.

Ommexecha SERVILLE, Ann. Sci. Nat., XXII, p. 285 (1831); BLANCHARD, Ann. Soc. Ent. France, V, p. 607 (1836); BOLIVAR, An. Soc. Españ. Hist. Nat., pp. 21, 27, 493 (1884). For a more complete synonymy see KIRBY, Syn. Cat. Orth., III, p. 296 (1910).

66. *Ommexecha servillei* Blanchard.

Ommexecha servillei BLANCHARD, Ann. Ent. Soc. France, V, p. 613, pl. 22, figs. 2, 3 (1836).

The material collected by Mr. J. Steinbach at an elevation of 350 meters above sea-level in the Province del Sara, Bolivia, contains two female specimens of this species.

67. *Ommexecha macropterum* Blanchard.

Ommexecha macropterum BLANCHARD, Monog. Ommex., p. 610, pl. 21, figs. 3, 4 (1836).

A single male and five females from the Province del Sara, and two males from Las Juntas, Department of Santa Cruz, Bolivia, are referred here. The former lot were taken at an elevation of 350 meters, and the latter at 250 meters above sea-level. They were all collected by J. Steinbach in the months of February and December, 1913.

Family PYRGOMORPHIDÆ.

Genus OMURA Walker.

Omura WALKER, Cat. Derm. Salt. Brit. Mus., III, p. 503 (1870); BOLIVAR, An. Soc. Españ. Hist. Nat., V, p. 215 (1905); *IB.*, Gen. Ins., Fasc. 90. Orth. Acrid., Pyrg., pp. 39, 41 (1909).

Protomachus STÅL, Bihang. Svensk. Akad. Handl., IV (5), p. 53 (1776); BOLIVAR, An. Soc. Españ. Hist. Nat., XIII, pp. 23, 6c, 494 (1884).

68. *Omura congrua* Walker.

Omura congrua WALKER, *l. c.*, p. 504 (1870); BOLIVAR, Gen. Ins., Fasc. 90, Orth. Acrid., Pyrg., p. 41, pl. 1, figs. 5, 5a (1909).

Protomachus depressus STÅL, *l. c.*, p. 54 (1876); BOLIVAR, An. Soc. Españ. Hist. Nat., XIII, pp. 61, 494, pl. 1, fig. 7 (1884).

A pair, male and female, of this peculiar locust are before me. They come from Pied Saut, Oyapok River, in French Guiana, where they were collected by S. M. Klages in November, 1917. C. M. Acc. No. 6111.

Family CYRTACANTHACRIDÆ.

Genus PROCOLPIA Stål.

Procolpia STÅL, Recens. Orth., I, pp. 28, 45 (1873); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, p. 41 (1898); BRUNER, Proc. U. S. Nat. Mus., XXX, pp. 640, 643 (1906).

69. *Procolpia minor* Giglio-Tos.

Procolpia minor GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 17 (1894); REHN, Proc. Acad. Nat. Sci. Philad., LIX, p. 169 (1907); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 643 (1906).

Munatia australis BRUNER, Proc. U. S. Nat. Mus., XXX, p. 644 (1906).

The present collection contains one male from Buena Vista and a female from the Rio Japacani district of eastern Bolivia. They were taken by J. Steinbach in the spring of 1915. C. M. Acc. No. 5573.

70. *Procolpia emarginata* (Serville).

Xiphicerca emarginata SERVILLE, Ann. Sci. Nat., XXII, p. 271 (1832).

Procolpia emarginata STÅL, *l. c.*, p. 45 (1873); BRUNER, Biol. Cent.-Amer., Orth. II, p. 223 (1907).

The collection contains a single female specimen which belongs here. It was taken at Quatro Ojos, Department of Santa Cruz, Bolivia, by J. Steinbach.

Genus PRORHACHIS Scudder.

Prorhachis SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 269 (1875); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, p. 40 (1878).

71. *Prorhachis granulosa* Scudder?

Prorhachis granulosa SCUDDER, *l. c.*, p. 269 (1875).

One male from Las Juntas, Department of Santa Cruz, and one female from the Province del Sara, Bolivia, are referred to Scudder's species. The former was collected in December and the latter in either March or April of the same year. In addition there are two rather young nymphs, which also seem likely to belong here. The latter come from Las Juntas, in the Department of Santa Cruz. They, together with the male, are part of C. M. Acc. No. 5060; while the female belongs to C. M. Acc. No. 5058. They were all taken by J. Steinbach.

The young nymphs have the median pronotal carina greatly arched and deeply notched.

Genus ÆOLACRIS Scudder.

Æolacris SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 269, note (1875); PICT. & SAUSS., Mitth. Schweiz. Ent. Ges., VII, p. 340 (1887); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, p. 41 (1898); BRUNER, Biol. Cent.-Amer., Orth., II, pp. 209, 224 (1907).

72. *Æolacris caternaulti* (Feisthamel).

Xiphicera caternaultii FEISTH., Mag. Zoöl., VII (9), pl. 184 (1837).

Xiphicera octolunata SERVILLE, Ins. Orth., p. 615, no. 5 (1839).

Æolacris caternaultii PICT. & SAUSS., *l. c.*, p. 340, no. 2 (1887); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 301, p. 3 (1897).

Xiphicera octomaculata SCUDDER, Proc. Bost. Soc. Nat. Hist., XII, p. 337, no. 16 (1869).

A single female coming from the Mana River district in French Guiana belongs here. It was taken in May, 1917. C. M. Acc. No. 6008.

Genus PRIONOLOPHA Stål.

For a bibliography and synonymy of this genus see Kirby, Syn., Cat. Orth., III, pp. 358 and 359. Only the one species is known. Nevertheless it has been described many times, as indicated by the extensive synonymy (*l. c.*, pp. 358-359).

73. *Prionolopha serrata* (Linnæus).

A pair, male and female, are contained in the material coming from Cayenne, French Guiana. They were taken in February, 1917, and belong to C. M. Acc. No. 5873.

Genus COLPOLOPHA Stål.

Colpolopha STÅL, Öfv. Vet.-Akad. Förh., XXX (4), p. 53 (1873). See Kirby, Syn. Cat. Orth., III, p. 362, for additional bibliography.

74. *Colpolopha obsoleta* (Serville).

Tropinotus obsoletus SERVILLE, Ann. Sci. Nat., XXII, p. 274 (1831); *IB.*, Ins. Orth., p. 620 (1839).

Colpolopha obsoleta PICT. & SAUSS., Mitt. Schweiz. Ent. Ges., VII, p. 338 (1887). *Xiphocera basalis* WALKER, Cat. Derm. Salt. Brit. Mus., III, p. 522 (1870).

The collections made by S. M. Klages on the Mana River of French Guiana during July, 1917, contain five males and four females of this locust. They are a part of C. M. Acc. No. 5008.

Genus CORYACRIS Rehn.

Coryacris REHN, Proc. U. S. Nat. Mus., XXXVI, p. 111 (1909); BRUNER, Ann. Carnegie Mus., VIII, pp. 53, 462 (1913).

75. *Coryacris angustipennis* (Bruner).

Eleaochlora angustipennis BRUNER, 2nd Rept. Locust. Comm. B. Aires, p. 58 (1900).

Coryacris diversipes REHN, Proc. U. S. Nat. Mus., XXXVI, pp. 111-114, figs. 1, 2 (1909).

Two females were collected by J. Steinbach in the Province del Sara, Bolivia, in November, 1912, and in December, 1913, at an elevation of 350 meters above sea-level.

Genus ZONIOPODA Stål.

Zoniopoda STÅL, Recens. Orth., I, pp. 32, 51 (1873); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 652 (1906); *IB.*, Ann. Carnegie Mus., VIII, p. 57 (1911).

76. *Zoniopoda tarsata* (Serville).

Acridium tarsata SERVILLE, Ann. Sci. Nat., XXII, p. 283 (1831).

Zoniopoda tarsata STÅL, Recens. Orth., I, p. 51 (1873); BRUNER, Ann. Carnegie Mus., VIII, pp. 57, 59 (1911).

The material now being studied contains a single female specimen,

taken by Steinbach in the Province del Sara, Bolivia, at an elevation of 350 meters above sea-level, collected February, 1913. C. M. Acc. No. 5058. A male and a female were also taken by Steinbach at Buena Vista. C. M. Acc. No. 5573.

Mr. James A. G. Rehn at one time regarded *Z. cruentata* (Blanchard) as being distinct from *tarsata* (see Proc. Acad. Nat. Sci. Phil., LIX, p. 175, 1907). More recently, however, he thinks that they only represent geographic races, or merely environmental phases of a single species. (Trans. Am. Ent. Soc., XLIV, p. 202, 1918.)

Genus OPTHALMOLAMPIS Saussure.

Ophthalmolampis SAUSSURE, Rev. Zoöl., (2), XI, p. 394 (1859); STÅL, Bihang till Svensk. Akad. Handl., V, p. 42 (1878); BRUNER, Ann. Carnegie Mus., VIII, p. 476. (1913).

77. *Ophthalmolampis geniculapicta* sp. nov.

Among the described species, as shown by the synoptical key prepared by me and published in the ANNALS, Vol. VIII, pp. 476-477, this form is most nearly related to *O. geniculata* Stål. It is a medium-sized insect with two narrow, interrupted, pale longitudinal lines on the sides of the pronotum, the one above bounding the disc on its outer margin, and the other located about two-thirds of the distance towards the lower margin. Hind femora with the geniculæ black, ornamented by three large orange-red maculæ, two of which are situated on the sides and the other above. The hind tibiæ at their base also are provided with a prominent macula of the same color.

Head of moderate size, about as wide as the front edge of the pronotum, into which it fits almost to the eyes; the occiput but little, if any, elevated, very coarsely and deeply pitted or punctured, as are the front, cheeks, pronotum, and sides of both the meso- and meta-thorax. Vertex narrow, depressed between the upper portion of the prominent eyes, but little wider than one-half the diameter of the basal antennal joint, the fastigium widely and roundly sulcate, the frontal costa not prominent, as wide above the antennæ as the fastigium, not sulcate, but coarsely pitted, a little narrowing anteriorly and terminating at the ocellus, which is located at a point a little in advance of a line drawn across the front at the lower edge of the antennal sockets. Antennæ rather slender, about as long as the hind femora, in nowise ensiform, but with all the segments slightly flattened.

Anterior and middle legs only moderately robust, of normal length; the hind femora decidedly robust and with all the carina strongly spinoso-tuberculate; the hind tibiæ seven-spined on both edges, about 1.5 mm. shorter than the hind femora; the three tarsal joints of about equal length, and very hirsute. Tegmina much abbreviated, less than one-half the length of the abdomen, their upper edges a trifle overlapping at the apex.

General color of insect flavo-olivaceous, the antennæ vinaceous red, with a tinge of black along the middle of the upper side of their basal half-dozen joints or segments. Face, from the base of the antennæ along the lower margin of the eyes and diagonally across the cheeks, as well as the sides of the occiput to its hind border, also the base of the clypeus, and the lower margin of the front, white-lined, these lines apparently in continuation of the pronotal vitta. Tegmina each with two longitudinal white lines. Eyes æneous. Hind tarsi rubro-testaceous.

Length of body, ♀, 26 mm.; of pronotum, 6.25 mm.; of tegmina, 7 mm.

Habitat: The type of this interesting species bears the label "Prov. del Sara, Bolivia, 350 M., J. Steinbach." C. M. Acc. No. 5058.

78. *Ophthalmolampis albolineata* Bruner.

Ophthalmolampis albolineata BRUNER, Ann. Carnegie Mus., VIII, pp. 476, 477-478 (1913).

A single specimen of this species is at hand. It was collected by J. Steinbach in December, 1913, at Las Juntas in the Department of Santa Cruz, Bolivia, at 250 M. above sea-level. C. M. Acc. No. 5060.

Genus TRYBLIOPHORUS Serville.

Trybliophorus SERVILLE, Ann. Sci. Nat., XXII, p. 274 (1831); *IB.*, Ins. Orth., p. 631 (1839); KIRBY, Syn. Cat. Orth., III, p. 392 (1910); BRUNER, Biol. Cent.-Amer., Orth., II, pp. 212, 251 (1907-8). For additional bibliography see Kirby, *l. c.*

79. *Trybliophorus octomaculatus* Serville.

Trybliophorus octomaculatus SERVILLE, *ll. cc.*, p. 275 (1831), p. 632 (1839); BURMEISTER, Handb. Ent., II, p. 618 (1839).

A pair of this highly colored locust are at hand from Pied Saut, Oyapok River, French Guiana, where they were collected by S. M. Klages in November, 1917. C. M. Acc. No. 6111.

80. *Trybliophorus modestus* sp. nov.

Quite small, a somewhat robust, and dull and plain colored insect for a member of this genus, but with the definitely produced hind border of the disc of the pronotum and the strongly roughened and serrated hind femora, so characteristic of other members of the genus.

Antennæ robust, pallid, or faintly testaceo-ferruginous, the basal joints flattened and quite wide, gradually narrowing apically and giving to them an ensiform appearance, when compared with the filiform structure of these members, as they are in the remainder of the described species. Head of the usual form, the eyes large and prominent, the vertex narrow, about half the width of the basal antennal joint; the fastigium of the vertex depressed, a little longer than wide, linearly sulcate, but with coarse lateral walls. Frontal costa plane, prominent, and broad between the antennæ, narrowly sulcate and suddenly much lower below the ocellus, not quite reaching the clypeus; viewed laterally broadly rounded between the antennæ. Front rugulose, not punctulate, as in *T. octomaculatus*, and its allies; occiput also faintly and sparsely pitted. Pronotum rather robust and punctulate, the anterior lobe subcylindrical, but little expanding caudad; the posterior lobe a little expanding, hind margin of the disc produced at middle, but somewhat shorter, and with the apex a little more rounded than usual. Tegmina and wings somewhat abbreviated, about four-fifths the length of the abdomen. Hind femora robust, extending beyond the tip of the abdomen nearly as much as the length of the geniculæ, the tibiæ six-spined externally, rather strongly hirsute; the first and second tarsal joints about equal in length. Tip of the male abdomen acuminate and a little upturned; the cerci finger-like, directed upward and a little to the rear, about five times as long as wide at their base, a little narrower on their apical fourth and acuminate. Prosternal spine robust, short, blunt, a little transverse.

General color pale brunneo-testaceous, sides of the head back of the eyes, the upper fourth of the lateral lobes of the pronotum and the disc, and the costal fields of the tegmina longitudinally vittate with piceous, on the tegmina divided by a narrow pallid line. Genicular lunules, or arcs, and bases of the tibiæ infuscated. Antennæ a little darker than the prevailing color of the insect. Legs concolorous, the genicular lobes more pallid.

Length of body, ♂, 20 mm.; of pronotum, 7 mm.; of tegmina, 9 mm.; of hind femora, 12.5 mm.

Habitat: The only specimen at hand, a male, and the type of the species, comes from Buena Vista, eastern Bolivia, where it was taken by J. Steinbach. C. M. Acc. No. 5573.

Genus PRORACHTHES Gerstæcker.

Prorachthes GERSTÆCKER, Mitth. Ver. Neu-Vorpomm. u. Rügen, XX, p. 38 (1889).

Prorachtes GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, p. 44 (1898).

The present genus was erected to receive a very peculiar elongate cylindrical locust coming from Peru.

81. *Prorachthes insignis* Gerstæcker.

Prorachthes insignis GERSTÆCKER, *l. c.*, p. 40 (1889).

A single male specimen of this remarkable locust is at hand. It comes from the Rio Japacani of eastern Bolivia, where it was taken in February 1917, by J. Steinbach. It bears no accession number, but undoubtedly should be included in Acc. No. 5573.

As Gerstæcker's description was based only on the female sex, a few additional features possessed by the male may be noted here. In this sex the vertex in front of the eyes is almost cylindrical, narrowing but little towards the front, linearly grooved in the middle above and below, with the frontal costa raised in the form of an elevated wall, which is linearly sulcate from its middle to the base of the clypeus. The latter has its basal middle triangularly set into the front. The median ocellus is located just opposite the anterior margin of the eyes, while the lateral ocelli are situated in front of the middle of the eyes, and a very little in advance of them and appear as small, smooth, rounded warts. The last ventral segment of the male abdomen is greatly elongate and dagger-like.

Length of body, ♂, 61 mm.; of vertex in front of the eyes, 7.5 mm.; of pronotum, 6 mm.; of tegmina, 31 mm.; of hind femora, 20 mm.; of last ventral segment of abdomen, 11 mm. The antennæ of the specimen are imperfect.

Genus LEPTY SMA Stål.

Leptysma STÅL, Recens. Orth., I, pp. 42, 85 (1873); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 657 (1906); *IB.*, Ann. Carnegie Mus., VIII, pp. 71 (1911), 478 (1913).

As suggested on page 71 of Vol. VIII of the ANNALS, the present genus contains at least a dozen and a half distinct, though rather closely related forms, which occur in tropical and subtropical America. Some of these already have been described, but others not. The principal reason for this state of affairs seems to be due chiefly to the lack of the necessary material at any one time, as well as the difficulty of definitely determining the identity of the species described by Burmeister, Serville, and Thunberg. The present collection certainly contains three forms, or possibly five. They belong to C. M. Acc. No. 5058. They seem to be separable as given under Nos. 82-86 inclusive.

82. *Leptyisma gracilis* Bruner.

Leptyisma gracilis BRUNER, Proc. U. S. Nat. Mus., XXX, p. 658 (1906); *IB.*, Ann. Carnegie Mus., VIII, p. 71 (1911).

The material collected by J. Steinbach in the Province del Sara, Bolivia, contains two males of this delicate little species. They were taken in October, 1913, at an elevation of 350 meters above sea-level. C. M. Acc. No. 5058. Two others taken by the same collector bear the label "Rio Japacani, E. Bolivia, February 1917. C. M. Acc. No. 5573."

83. *Leptyisma filiformis* (Serville).

Opsomala filiformis SERVILLE, Ins. Orth., p. 503 (1839).

Leptyisma filiformis STÅL, Recens. Orth., I, p. 85 (1873); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 658 (1906); *IB.*, Ann. Carnegie Mus., VIII, p. 72 (1911).

Five males and six females seem to belong to *Opsomala filiformis* Serville, as I have determined that species. They all come from the Province del Sara, Bolivia, where they were collected by J. Steinbach in October, 1913, at an elevation of 350 meters above sea-level. C. M. Acc. No. 5058.

84. *Leptyisma* sp. No. 1

Two males and possibly a female of a form which seems to be distinct from *L. filiformis*, are set aside as species No. 1. They are a little smaller and somewhat slenderer than the specimens referred to *L. filiformis*. They do not have the abdomen dusky above, and have the fastigium larger and longer than in the individuals assigned to No. 83. They measure as follows: Length of body, ♂, 33 mm.,

♀, 38 mm.; of pronotum, ♂, 4.5 mm., ♀, 5.1 mm.; of tegmina, ♂, 31 mm., ♀, 37 mm.; of hind femora, ♂, 13 mm., ♀, 15 mm.

Habitat: Province del Sara, Bolivia; taken October, 1913, by J. Steinbach. C. M. Acc. No. 5058.

85. *Leptysma* sp. No. 2.

A single female taken in October by the same collector and coming from the same locality as the two preceding is set aside as possibly representing still another species. It is about the size of the *L. filiformis*, recorded above. The most noticeable differences are in the paler, almost uniform, color of the abdomen, sides of the head, and the lower margin of the thorax. In this specimen the fastigium of the vertex is a little longer and broader, while the eyes are a trifle less prominent than in *L. filiformis*. It is similar to, and may be the same as, the insect described by me in a former volume of the ANNALS (VIII, p. 72) as *L. intermedia*. This, of course, is only conjecture, since the type of that species is not at hand for comparison. This insect belongs to the same accession as *Leptysma* No. 1.

86. *Leptysma* sp. No. 3.

A fifth well-marked form is represented by a single female, which recalls the species *L. grossa* described by the present writer in the ANNALS, Vol. VIII, pp. 74-75. The present specimen, while quite gross in the structure of its head and thorax, is considerably smaller than the insect with which it is compared. It measures 48 mm. in length, with the head only 11 mm. instead of 12.5 mm. long.

Habitat: The insect is from the Province del Sara, Bolivia, taken at an elevation of 350 meters above the sea, by J. Steinbach in October, 1913. C. M. Acc. No. 5058.

Genus LEPTYSMINA Giglio-Tos.

Leptysmina GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 34 (1894), XIII, no. 311, p. 44 (1898); BRUNER, 2d Rept. Locust Comm. B. Aires, pp. 53, 65 (1900); IB., Journ. N. Y. Ent. Soc., XIV, p. 151 (1906); IB., Proc. U. S. Nat. Mus., XXX, pp. 641, 658 (1906).

The genus *Leptysmina* contains two described forms, and apparently a third, if the specimen among the material now being studied is distinct from *pallida*, as it seems to be.

87. *Leptysmia minor* sp. nov.

Similar to, but smaller and somewhat slenderer than *L. pallida* and *L. rosea* of Giglio-Tos, but most nearly resembling the latter in its general color, if my material is correctly determined.

Comparatively slender, the head elongate, with the occiput on nearly the same plane as the pronotum; the fastigium of the vertex with the sides nearly parallel, and with its apex broadly rounded, the median and accessory carinæ prominent and with the intervening sulci profound. Antennæ strongly ensiform and decidedly longer than the head. Vertex narrow, but little wider than the diameter of the second antennal joint, heavily longitudinally carinated in the middle, and lightly but acutely carinated at its sides. Pronotum subcylindrical, plainly widening cephalad, the median carina fairly prominent throughout, the transverse sulci plainly visible, but not profound. Tegmina somewhat mutilated near their base, but surpassing the tip of the abdomen. Hind tibiæ thirteen-spined externally, seventeen-spined internally.

General color above pale ferrugineo-testaceous; legs, front, and under side pale grass-green. Cheeks, lower portion of the sides of pronotum, and the pleura, longitudinally striped with creamy white, above which is a stripe of a fusco-olivaceous tinge, which gradually merges into the general dorsal hue. Antennæ ferruginous, the eyes castaneous, with a brassy hue or luster in certain lights.

Length of body, ♀, 37 mm.; of head in advance of the pronotum, 8 mm.; of pronotum 6 mm.; of tegmina, 29 mm.; of hind femora, 16 mm.

The only specimen, the type, comes from the Cayari Island in the Uassa Swamp. It was taken in May, 1918, by S. M. Klages. C. M. Acc. No. 6177.

Genus OPSOMALA Serville.

Opsomala BURMEISTER, Handb. Ent., II, p. 610 (1838); SERVILLE, Ins. Orth., III, p. 419 (1910). For additional synonymy see Kirby, *l. c.*

This genus is separated from among the other Leptysmine locusts by the plain last ventral segment of the abdomen of the males. Otherwise the members are very similar to those assigned to the genus *Stenacris* of Walker. Kirby lists three species definitely, and three doubtfully, as belonging to the genus. In the case of *interior* Bruner, he is mistaken, as it is definitely a *Stenacris*. Probably in the case

of *stali*, although it has the external margin of the hind tibiæ armed with nine or ten spines, he may be correct. But the inclusion of *nasica* and *falconia* is undoubtedly in error. We now find before us a new species, which must be assigned to the genus. We then still have four species, which may be separated by the subjoined synoptical key.

SYNOPSIS OF THE SPECIES OF OPSOMALA.

- A. Antennæ decidedly ensiform. Hind tibiæ provided with 9-10 spines externally. Tegmina narrowly acuminate. Wings rather strongly infuscated, or at least with obscure veins [Southwestern Brazil]...*stali* Bruner.
- AA. Antennæ only faintly ensiform, or subensiform. Hind tibiæ seven- to nine-spined externally. Tegmina subacuminate. Wings not greatly infuscated, nor with especially dark veins.
- B. Hind tibiæ and their tarsi wholly pale coral-red. The abdomen above testaceous.
- C. Insect larger and more robust (♂, 34-35, ♀, 40 mm.). General color pale yellowish grass-green. [Brazil, Paraguay, and Bolivia.].....*coccineipes* Bruner.
- CC. Insect smaller and rather slender (♂, 29, ♀, 36 mm.). General color pale bluish green. (Cayenne.).....*intermedia* sp. nov.
- BB. Hind tibiæ with a large green space basally. The abdomen above blood-red (Brazil).....*viridis* Serville.

88. *Opsomala coccineipes* (Bruner).

Arnilia coccineipes BRUNER, Proc. U. S. Nat. Mus., XXX, p. 659 (1906); *IB.*, Biol. Cent.-Amer., Orth., II, p. 254 (1908).

A single female of this locust is at hand from the Province del Sara, Bolivia. It was taken in the month of October, 1913, by Steinbach. C. M. Acc. No. 5058.

Judging from the structure of the hind tibiæ and femora, and from personal experience while collecting in Paraguay, I should say that this insect is a denizen of open meadows and away from water. Possibly the same characteristics may be true of all of the species of this genus.

89. *Opsomala intermedia* sp. nov.

A rather slender species, of a pale blue-green color, apparently intermediate between the species *coccineipes* and *viridis*, as indicated by the Synoptic Key given above. Head about as wide as the anterior edge of the pronotum, the front rather strongly oblique, the fastigium a little wider at base than long, its sides a little rounded (♂), or nearly

straight (♀), and a little elevated into bounding carinæ. Vertex in the male about as wide, in the female one-half wider than the diameter of the basal antennal joint. Antennæ sublinear of moderate length, and in nowise hastate, the basal joints alone only faintly depressed.

Pronotum subcylindrical, very gently and broadly strangulate, finely rugulose and punctate, the transverse sulci fine and little impressed; anterior edge little, but widely and roundly, emarginate at middle; the hind margin of disc subangulate. Tegmina narrow, extending about one-fifth of their length beyond the tip of the abdomen in both sexes, subacuminate. Hind femora normal, somewhat shorter than the abdomen; the hind tibiæ slender, but with the lateral margins acute and a little prominent apically, armed externally with from seven to eight spines. Tip of the male abdomen subacuminate, the last ventral segment simple, about one-half longer than its basal width, the outer half finger-like and directed backwards and upwards, its extreme apex blunt. Supra-anal plate small, its apical half narrowed and extending beyond the strongly curved pale cerci; the edges of the median sulcus and apex of the last abdominal segment on the upper side marked with black. Prosternal spine rather elongate, clubbed, and blunt at its apex and somewhat directed to the rear. Anterior and median legs short, small.

General color of head, pronotum, pleura, and tegmina pale bluish green; the legs and underside paler, inclining to dirty white or testaceous; the hind tibiæ and tarsi coral-red. Antennæ testaceo-ferruginous, in the male infuscated apically. Hind femora internally pale piceous, owing to the shining through of the dried muscular tissue. Abdomen pallid, uncolored above.

Length of body, ♂, 29 mm., ♀, 36 mm.; of pronotum, ♂, 4.8 mm., ♀, 6.5 mm.; of tegmina, ♂, 25 mm., ♀, 33 mm.; of hind femora, ♂, 13.5 mm., ♀, 16 mm.

Two males and a female of this new species from Cayenne. They were taken in February and March, 1917, by S. M. Klages. C. M. Acc. No. 5873. One of the males is made the type of the species.

Genus STENACRIS Walker.

Stenacris WALKER, Cat. Derm. Salt. Brit. Mus., IV, p. 651 (1870); KIRBY, Syn. Cat. Orth., III, p. 413 (1910); BRUNER, Annals Carnegie Mus., VIII, p. 479 (1913).

Armilia STÅL, Recens. Orth., I, pp. 42, 85 (1873).

As indicated on page 479 of volume VIII of these ANNALS, the insects which comprise the genus *Stenacris* are quite similar in their general appearance to those referred above to *Opsomala* Serville. In the representatives of *Stenacris* "the last ventral segment of the male abdomen is quite complex in structure, and varies very distinctly among the different species," while in *Opsomala* it varies but little. About a dozen species have already been described and now four more are recognized and herewith described.

90. *Stenacris vitreipennis* (Marschall)?

Gryllus vitreipennis MARSCHALL, Ann. Wien. Mus., I, pp. 214-215, pl. 18, fig. 6 (1836).

Stenacris chlorizans WALKER, Cat. Dermapt. Salt. Brit. Mus., IV, pp. 652, 653 (1870); KIRBY, l. c., p. 413 (1910). For fuller synonymy see the last reference.

There are two females of a locust belonging to this genus at hand. They come from the Isle of Pines, where they were collected at Nueva Gerona in June, 1912. They are placed here, because there can be but little doubt that they are the same species as the insect well-known from the southeastern portions of the United States.

91. *Stenacris cylindroides* (Stål).

Opsomala cylindroides STÅL, Kong. Svensk. Freg. Eugen. Resa., Ins., p. 325 (1860).

Arnilia cylindroides STÅL, Recens. Orth., I, p. 85 (1873).

Stenacris cylindroides REHN, Proc. U. S. Nat. Mus., XXXVI, pp. 135, 136 (1909).

The present species does not seem to be represented in the material now at hand, although it has been reported from the adjoining regions of Brazil and Paraguay. Judging from the experience of the present writer *cylindroides* is confined chiefly to the coastal regions of Brazil, with Rio Janeiro as the type-locality. The specimens of this species heretofore reported from Paraguayan and interior Brazilian localities may have been one or the other of the two following, or even a distinct and allied form.

92. *Stenacris interior* (Bruner).

Arnilia interior BRUNER, Biol. Cent.-Amer., Orth., II, p. 254 (1908).

Opsomala interior KIRBY, Syn. Cat. Orth., III, p. 419 (1910); BRUNER, Ann. Carnegie Mus., VIII, pp. 81 (1911), 479 (1913).

There are three males in the collections now receiving attention which are apparently the same as the insect to which this name was given, but as the type is not at hand, I hesitate to give a more com-

plete description of the species now. Two of them come from the Upper Mamoré River in the Department of Santa Cruz, Bolivia, where they were taken in December, 1913, at an altitude of 200 meters above sea-level. The other specimen was collected in November, at Quatro-Ojos in the same province at an elevation of 300 meters. All three of them were obtained by Haseman. The last mentioned specimen belongs to C. M. Acc. No. 5059, and the former two to C. M. Acc. No. 5061.

All three specimens show a decided rufous tinge on the dorsum of the pronotum, as did the type-material, as now recalled by me.

93. *Stenacris forficulata* sp. nov.

Two males belonging to this genus and coming from Quatro-Ojos, in the Department of Santa Cruz, Bolivia, are separated from the preceding by the structure of the male genitalia. They belong in the section of the genus containing *S. columba* and *S. fissicauda* Bruner, as characterized in the *Biologia Centrali-Americana*, Orth., II, pp. 225 and 258. When compared with these two species *forficulata* approaches *fissicauda* most closely in size and in the structure of the apical segment of the male abdomen. The general color of the insect is pale grass-green, with little or no indication of a longitudinal pallid lateral line on the sides of the head, pronotum, and thorax, as is so frequently seen in several of the species of the genus. The wings, although not spread, appear to be infuscated and to have a slightly bluish tinge. The dorsum of the abdomen, however, is a little infuscated, and the hind tarsi are tinged with pinkish red.

Length of body, ♂, 26 mm.; of pronotum, 5.5 mm.; of tegmina, 22 mm.; of hind femora, 13 mm. The female which is also assigned to this species is 30 mm. in length, with the tegmina 27 mm. long.

Habitat: Quatro-Ojos, Department of Santa Cruz, Bolivia, at an altitude of 300 meters above sea-level. Taken in November, 1913, by J. Steinbach. C. M. Acc. No. 5059.

94. *Stenacris* sp.(?)

There are at hand two females of what appears to be still another species of *Stenacris*. They were taken on Uassa Island in the Uassa Swamp during the month of June, 1918, by S. M. Klages. C. M. Acc. No. 6176.

These individuals have the general aspect of some of the females of the Cayenne specimens which I am describing in the present paper as *Stenacris cayennensis*. I observe, however, that these specimens from the Uassa swamp have paler wings than do those coming from Cayenne.

95. *Stenacris cayennensis* sp. nov.

A comparatively small, slender insect, related to the species *minor* and *marschalli* of Bruner, as described in the *Biologia Centrali-Americana*, Orthoptera, Vol. II, pp. 256 and 257, but closer to the latter than the former. In the present characterization comparisons therefore will be made with the descriptions of those species.

General color somewhat variable, owing to the variation in the amount of dusky markings present in different individuals. Head moderately large, a little wider than the anterior edge of the pronotum; eyes large and prominent, separated above by a space very little wider (σ^7) or fully twice (φ) that of the diameter of the basal antennal joint; the fastigium depressed, horizontal, a little shorter than its basal width, the width broadly convex, and showing only a faint indication of sulcation near its anterior edge, the lateral edges very gently bowed and faintly carinated, this most apparent in the males. Front rather strongly retreating, viewed laterally gently bowed inwards at middle, owing to the prominence of the frontal costa between the antennæ, the latter moderately well defined, the lateral walls heavy and bisinuate, giving the costa two wider portions, viz., one above between the antennæ, and the other at the median ocellus, continuous to the clypeus, roundly and deeply sulcate throughout; lateral or facial carinæ slender, straight, divergent, extending from the lateral ocelli to the outer facial angles at the base of the clypeus. Antennæ of moderate length, nearly (φ) or quite (σ^7) reaching the posterior margin of the pronotum, almost linear, only the three or four basal joints slightly depressed. Pronotum subcylindrical, considerably longer than wide, the middle a little arcuate or strangulate by having the base and apex slightly wider than at middle, the surface finely punctulate, the transverse furrows well marked; front and hind borders broadly rounded. Tegmina fully developed, extending beyond the tip of the abdomen in both sexes, their apex subacuminate. Hind femora normal, not reaching the apex of the abdomen in either sex; the tibiæ not markedly expanded

apically, six- or seven-spined externally, nine-spined internally; anterior and middle legs short, but fairly robust. Last ventral segment of the male abdomen with the main portion a little longer than the basal width, its outer two-thirds with the sides parallel, and ending on either side in short, prominent, rounded lobes; the median portion fully as long as the basal, directed upwards, and with its apical half slender and directed upward and obliquely, as well as arcuately, to the rear. Cerci rather large, their apical portion transverse, truncated, and with the apex infuscated. Valves of the ovipositor short, their margins six- or seven-toothed, the teeth strong. Prosternal spine large, robust, the apex evenly rounded and directed gently to the rear.

General color various shades of pale green, white, and testaceous, varied with piceous, ferruginous, brown, and black. These hues are arranged in longitudinal streaks and patches as follows: occiput, cheeks back of the eyes, disc, and upper part of the sides of the pronotum, meso- and metapleura, and the tegmina, prevailingly some shade of green; the occiput marked with two longitudinal divergent white stripes; the cheeks below, the lower third of the sides of the pronotum and the pleura longitudinally white; also, in the type, a white line running along each side of the disc of the pronotum; above this white lateral line is one of greater or less intensity of piceous, olivaceous, or ferruginous. The disc of the pronotum is usually ferruginous, vinaceous, or even brown, the abdomen above strongly infuscated, below pallid, the legs testaceous, or greenish stramineous. Antennæ ferruginous, a little infuscated internally at base and apically. Posterior edge of the last abdominal segment above and the carinæ of the supra-anal plate black; wings infuscated. In some specimens there is a somewhat general dark tinting of the whole insect both above and below, when the front, pectus at middle, and underside of the abdomen are vinaceous brown gradually shading off to testaceous and green, or to olivaceous. In some specimens the white lines are quite noticeably tinted with green.

Length of body, ♂, 24 mm., ♀, 31 mm.; of pronotum, ♂, 4 mm., ♀, 4.5 mm.; of tegmina, ♂, 20 mm., ♀, 26 mm.; of hind femora, ♂, 12 mm., ♀, 14.5 mm.; of antennæ, ♂, 8.5 mm., ♀, 7.75 mm.

Habitat: This insect is represented by three males and three females from Cayenne, French Guiana, collected in February and March, 1917, by S. M. Klages. They belong to C. M. Acc. Nos. 5873 and 5897. The male type belongs to the latter accession, while the female



type is from the former. There is also a male at hand from Mana River where it was collected in May. C. M. Acc. No. 6008.

96. *Stenacris megacephala* sp. nov.

This insect is characterized chiefly by its excessively large and smooth head, which is considerably wider than the anterior edge of the strangulate pronotum, which is likewise rather robust; also by the widely lamellate lateral edges of the hind tibiae.

Fastigium of the vertex depressed, somewhat declivant in front, the base almost twice as wide as the median length, separated from the vertex by a rather well-defined transverse furrow, the disc full and showing only slight indication of a longitudinal sulcus or irregularities, the sides nearly straight, the anterior angle obtuse. Vertex between the eyes fully twice the width of the basal antennal joint. Front somewhat oblique, but not so greatly as in the other species of the genus. The frontal costa rather broad and roundly sulcate, viewed laterally straight, its lateral walls not greatly sinuose, continuous to the base of the clypeus. Antennae sublinear, scarcely at all enlarged at their base, of normal length, not reaching much beyond the last transverse sulcus of the pronotum. The latter faintly and minutely punctulate, smooth, narrowest at the hind sulcus, which is narrow, but profound, the other sulci also deeply but narrowly impressed. Tegmina somewhat acuminate, extending but little beyond the tip of the abdomen. Valves of the ovipositor rather short, the teeth small and weak, the apex of the lower pair scarcely hooked. Prosternal spine moderately large, long and club-shaped, directed somewhat caudad, its apex blunt and almost touching the anterior margin of the mesosternum.

General color of front, head above, pronotum and tegmina olivaceous, lower edges of the cheeks, sides of the pronotum and meso- and metapleura rather widely streaked longitudinally with ivory-white, this in turn bordered above by a fuscous or dull piceous band, which gradually merges above into the general olive hue. Anterior and middle legs greenish, fading basally to testaceous, the hind femora olivaceous yellow, or greenish straw-color; hind tibiae olivaceous basally, becoming pale vinaceous apically, the hind tarsi coral-red. Antennae ferruginous, apically infuscated.

Length of body, ♀, 36 mm.; of head in front of the pronotum 5.5

mm.; of pronotum 6 mm.; of tegmina, 27 mm.; of hind femora, 15.5 mm.

Habitat: The type, a female, comes from Uassa Island, Uassa Swamp, where it was collected in June, 1918, by S. M. Klages. C. M. Acc. No. 6167. There is also a second female at hand, bearing the label "Oucatopi Island, S. M. Klages, C. M. Acc. 6178." It was likewise taken in June, and agrees in all respects with the type.

Genus *TUCAYACA* gen. nov.

Related to *Stenacris*, but differing from that genus in having the body of the males noticeably more robust, the face more strongly receding or oblique, the antennæ decidedly ensiform, and the hind legs comparatively heavier and longer. When compared with the various species of *Stenacris*, the type of the present genus, *T. aquatica*, is seen to have the last ventral segment of the abdomen of the male more elongate, tapering, and simple. In the table or key for separating the tropical American genera of *Leptysmæ* and allies (ANNALS, VIII, pp. 69-71) *Tucayaca* runs to *cc.* under *A.* In order to insert it we would then add the following:

- d.* Fastigium about as long as wide, its sides convergent from the base, and but little bowed, the lateral edges little, if at all, carinated. Occiput somewhat arched, the head shorter than the pronotum. Antennæ with the basal joints but little dilated. Apex of the male abdomen with the last ventral segment not greatly elongate, often quite elaborated with tubercles, spines, or other appendages. *Stenacris* Walker.
- dd.* Fastigium of the vertex a little longer than wide, the sides on its basal third or half parallel, beyond this point bowed, the lateral edges strongly carinated. Occiput straight, the head as long as the pronotum. Antennæ with the basal joints plainly dilated, giving to these members a subensiform appearance. Apex of abdomen of male with the last ventral segment rather elongate, not complicated with appendages, but gradually tapering, and directed backward and upward. *Tucayaca* gen. nov.

97. *Tucayaca aquatica* sp. nov.

General color wood-brown above, testaceous below. Sides of the head, pronotum, and pleura broadly banded with piceous, bordered below by a dirty white line. Eyes fairly prominent, nearly twice as long as wide. Vertex somewhat depressed, not quite as wide as the diameter of joint two of the antennæ, the latter about one-third longer than the head and the pronotum combined; the fastigium with its

disc rounded or convex, and bearing a longitudinal sulcus throughout; the frontal costa prominent, a little amplified above the antennæ, profoundly sulcate throughout, and continuous to the clypeus. Mesosternal lobes with their inner edges touching for a considerable portion of their length. Prosternal spine of moderate robustness, cylindrical, straight, its apex blunt. Tegmina acuminate, extending about one-fifth of their length beyond the tip of the abdomen. Abdomen gently tapering, the supra-anal plate scutellate, its apical third narrower, triangular, flat, and with its apex rounded. Cerci of moderate size, strongly curved upwards, the apex black. Hind tibiæ strongly dilated, their lateral edges acute, seven- to eight-spined externally.

Length of body, ♂, 27 mm.; of pronotum, 6 mm.; of tegmina, 23 mm.; of hind femora, 14.5 mm.

Habitat: Upper Mamoré River in the Department of Santa Cruz, Bolivia, December, 1913. The type and a second male were collected at an altitude of 200 meters above sea-level by J. Steinbach. C. M. Acc. No. 5061.

98. *Tucayaca normalis* sp. nov.

Very similar in general appearance to the preceding, but differing from it in its slightly larger size, the somewhat longer and differently shaped fastigium of the vertex, and in the broader and apically rounded last ventral segment of the male abdomen.

Head large, elongate, somewhat ascending, the front strongly retreating, viewed in profile nearly straight; the fastigium of the vertex moderately large, about two-thirds the length of the longest diameter of the eyes; its sides parallel at the base for a little less than one-half of its length, beyond this nearly straight and somewhat convergent to the narrowly rounded apex, the lateral edges heavily carinated; the disc viewed from the side strongly and arcuately convex, its middle longitudinally, evenly, and roundly sulcate. Frontal costa prominent, with the lateral walls bowed, and forming a rather wide ovate loop above between the antennæ, from this point very gently and evenly divergent below, reaching the clypeus, profoundly sulcate throughout. Antennæ rather heavy, slightly ensiform, somewhat longer than the head and pronotum combined, the basal joint rather robust, scarcely as long as wide, concolorous. Vertex as wide as the basal antennal joint, depressed in front, separated from the fastigium

by a transverse sulcus or depression. Pronotum subcylindrical, a little narrower at its middle than in front and behind; the surface minutely and closely punctulate; the transverse sulci narrow, not deeply impressed, but plainly visible; the median carina slender, but apparent throughout; both the anterior and posterior margins of the disc broadly rounded. Tegmina of moderate width, tapering only on their apical fifth, acuminate. Legs long and robust, the hind femora not quite reaching the tip of the abdomen of the male, their genicular area rather small, the lateral lobes acuminate, but not spined. Hind tibiae moderately expanded apically, where the lateral carinae are sharp and more or less lamellate, as well as closely fringed with hairs; provided internally with eleven and externally with ten spines. Last ventral segment of the abdomen of the male about twice as long as broad at the base, a little tapering, and with the apical portion spatulate, the apex slightly and roundly emarginate at middle. Cerci strongly curved upwards, the apical half transverse and obliquely docked from the inner edge. Supra-anal plate very similar to the general type for the group, its carinae and the edge of the preceding segment marked with black. Prosternal spine rather long and robust, directed strongly posteriorly or caudad.

General color above testaceo-ferruginous, under side and legs testaceous, possibly greenish in life, the sides marked from the lower edge of the eyes to the base of the hind femora with a prominent white stripe bordered above by one of piceous. Antennae ferruginous, their inner edge basally infuscated.

Length of body, ♂, 27 mm.; of pronotum, 4.5 mm.; of tegmina, 23.5 mm.; of hind femora, 14 mm.

Habitat: The type, and only representative of the species at hand, is from Oucatopi Island, where it was taken in June, 1918, by S. M. Klages. C. M. Acc. No. 6178.

Genus *INUSIA* Giglio-Tos.

Inusia GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 302, p. 30 (1897); BRUNER, Journ. N. Y. Ent. Soc., XIV, p. 151 (1906); *IB.*, Biol. Cent.-Amer., Orth., II, pp. 212, 259 (1907-8); *IB.*, Ann. Carnegie Mus., VIII, p. 70 (1911).

99. *Inusia chipmani* Bruner.

Inusia chipmani BRUNER, Journ. N. Y. Ent. Soc., XIV, p. 154 (1906); *IB.*, Biol. Cent.-Amer., Orth., II, pp. 259, 260 (1908); KIRBY, Syn. Cat. Orth., III, p. 414 (1910).

The present species is represented by three males and three females. They come from Cayenne, French Guiana, where they were collected from January to March, 1917. C. M. Acc. Nos. 5817 and 5873.

100. *Inusia pallida* Bruner?

Inusia pallida BRUNER, Proc. U. S. Nat. Mus., XXX, p. 660 (1906); *IB.*, Biol. Cent.-Amer., Orth., II, p. 259 (1908).

A single male specimen of the genus *Inusia* coming from the Province del Sara, Bolivia, is referred here with some doubt, since its coloration differs considerably from that of the type. But, as this one is a male, and the type was a female, the difference in color might be accounted for by the difference in sex. It was collected by J. Steinbach in December, 1912, at an altitude of 350 meters above sea-level. C. M. Acc. No. 5058.

Genus STENOPOLA Stål.

Stenopola STÅL, Recens. Orth., I, pp. 42, 83 (1873); BRUNER, Ann. Carnegie Mus., VII, p. 70 (1911); KIRBY, Syn. Oat. Orth., III, p. 415 (1910).

101. *Stenopola dorsalis* (Thunberg)?

Truxalis dorsata THUNBERG, Nova. Acta Upsal, IX, p. 80 (1827).

Stenopola dorsalis STÅL, Recens. Orth., I, p. 83 (1873); KIRBY, *l. c.*, p. 415 (1910).
Opomala femoralis WALKER, Cat. Derm. Salt. Brit. Mus., III, p. 509 (1870).

Three males of a small locust coming from the Mana River, French Guiana, are placed here. They were collected in May, 1917, by Klages. C. M. Acc. No. 6008.

Genus OXYBLEPTA Stål.

Oxyblepta STÅL, Recens. Orth., I, p. 84 (1873).

Stenopola STÅL, Bihang. Svensk. Akad. Handl., V (4), p. 39 (1878); BRUNER, 2nd Rep. Locust Comm. B. Aires, pp. 54, 66 (1900); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, p. 45 (1898), etc.

The representatives of the present genus occur in tropical America from Panama to northern Argentina. Like the species of the next genus, they are of moderate size, and not very different in color and structure. As in some other genera of the group Leptysmæ, there is considerable diversity of opinion concerning the number and limitation of species.

The present collection contains representatives of apparently three distinct forms.

102. *Oxyblepta puncticeps* Stål.

Opsomala puncticeps STÅL, Eugénies Resa, Orth., p. 325, no. 68 (1860).

Stenopola (Oxyblepta) puncticeps STÅL, Recens. Orth., I, p. 84 (1873); ? GIGLIOTTOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 31 (1894); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 661 (1906).

Two females from the Province del Sara in Bolivia are referred here. One of them was taken in November, 1911, and the other either in November or December, 1912. They were collected by J. Steinbach at an elevation of 350 meters above sea-level, and agree in color and general appearance with a specimen in the present writer's possession taken in Paraguay by W. T. Foster. There are also two males and two females at hand, which bear the label "Rio Japacani, E. Bolivia, Feb. 1915, J. Steinbach, Acc. 5573." These I also refer here, although they are rather too small, if Stål's measurements are correct.

103. *Oxyblepta minor* sp. nov.

Very similar to the preceding, but much slenderer and smaller, and with shorter tegmina and wings.

Head rather large, wider than the front edge of the pronotum, the eyes very prominent, castaneous, and longitudinally streaked with testaceous, the vertex very narrow, not much wider than one-half the diameter of the rather heavy antennæ near their base. Fastigium of the vertex acuminate, of moderate size, the frontal costa prominent above between the base of the antennæ, almost obliterated below. Antennæ robust, in the male fully as long as, in the female a little shorter than, the hind femora. Front, occiput, disc of the pronotum, and the pleura strongly and closely punctulate, the checks more sparsely so. Tegmina as long as the abdomen, their apex somewhat acuminate. Hind femora moderately robust, in the female not quite reaching, in the male passing the tip of the abdomen a trifle.

General color as in *puncticeps*. The pale line on the lower portion of the lateral lobes of the pronotum and pleura beautifully maculate with gamboge-yellow. Geniculæ of the hind femora with the lunules ferruginous.

Length of body, ♂, 18.5 mm., ♀, 22 mm.; of pronotum, ♂, 3.6 mm., ♀, 4.2 mm.; of tegmina, ♂, 13 mm., ♀, 17 mm.; of hind femora, ♂, 10 mm., ♀, 12 mm.

Habitat: One pair *in coitu*, taken in December, 1913, at Las Juntas,

Department of Santa Cruz, Bolivia, by J. Steinbach, at an elevation of 250 meters above sea-level. C. M. Acc. No. 5060.

104. *Oxyblepta bohlsii* (Giglio-Tos).

Stenopola bohlsii GIGLIO-TOS, Boll. Zoöl. Jahrb., Syst., VIII, p. 813 (1895); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 661 (1906).

Three females of this species are at hand. They come from the Province del Sara, Bolivia, where they were collected at 350 meters above sea-level by J. Steinbach. C. M. Acc. No. 5058.

The present species differs from the two preceding in having the longitudinal lateral pallid lines composed of large, smooth, elevated maculae, instead of being continuous. The geniculæ of the hind femora are bright ferruginous.

Genus HENIA Giglio-Tos.

Henia GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, pp. 45, 55 (1898); BRUNER, Biol. Cent.-Amer., Orth., II, p. 261 (1908); *IB.*, Ann. Carnegie Mus., VIII, p. 70 (1911).

This genus is confined to South America, so far as our present knowledge reveals. It contains insects of medium size, the known species ranging in lengths from 15 to 21 mm. in the males, and 21 to 26.5 mm. in the females. Two species have been heretofore described and the present collection contains what seem to be three additional forms. All of the species are found very close to, or south of, the equator, and in the interior. They may be separated by the annexed key.

SYNOPSIS OF THE SPECIES OF HENIA.

A. Form of insect rather slender.

b. Smaller (σ^7 , 15-16 mm., ♀ , 21-23 mm.).

c. Antennæ shorter (9-11 mm.).

d. Antennæ less elongate, pale red (♀ , 8.75-9 mm.).

frenata Marschall.

dd. Antennæ more elongate, black (σ^7 , and ♀ , 10-11 mm.).

surinama sp. nov.

cc. Antennæ longer (13-15 mm.).

d. Length of body (♀ , 21 mm.). Dorsum of pronotum uniformly olive-yellow. Hind femora gamboge-yellow. Abdomen and venter pale cinnamon. *boliviana* Rehn.

dd. Length of body (σ^7 , 19, ♀ , 26.5 mm.). Dorsum of pronotum with the disc fusco-olivaceous, bordered at the sides by

prominent gamboge-yellow lines, in continuation of the pale dorsal angles of the tegmina. Hind femora pale grass-green.

Abdomen and venter flavo-testaceous. *steinbachi* sp. nov.

A.A. Form of insect rather robust. General color of the body and limbs pale brownish yellow. Dorsum of the head, pronotum, and tegmina infuscated and bordered on each side by testaceous. *testacea* sp. nov.

105. *Henia surinama* sp. nov.

Very similar to, and possibly the same as Marchall's *Gryllus frenatus*, from which our material varies chiefly in the slightly larger size, more acute tegmina, and somewhat longer and much darker antennæ. The measurements are as follows:

Length of antennæ, ♂ and ♀, 10-11 mm.; of body, ♂, 17 mm., ♀, 23 mm., of pronotum, ♂, 3.1 mm., ♀, 4 mm.; of tegmina, ♂, 15 mm., ♀, 18 mm.; of hind femora, ♂, 10 mm., ♀, 12.5 mm.

Habitat: Three males and two females are before me as I write. They all come from Cayenne, French Guiana, where they were collected in February and March, 1917. I have designated a male as the type. C. M. Acc. No. 5873.

106. *Henia steinbachi* sp. nov.

Related to *H. boliviana* Rehn, but very noticeably larger and darker colored, on account of the obscure occiput, disc of the pronotum, and dorsal field of the tegmina. Otherwise very little different from that species. In fact, aside from comparative size and color variation, the various species of the genus are very similar.

Length of body, ♂, 19 mm., ♀, 26.5 mm.; of pronotum, ♂, 4 mm., ♀, 5.15 mm.; of tegmina, ♂, 17 mm., ♀, 21 mm.; of hind femora, ♂, 12 mm., ♀, 15 mm.

Habitat: Two males and one female come from Las Juntas and a single male from Quatro-Ojos, in the Department of Santa Cruz, Bolivia. The last mentioned male was taken in November at an elevation of 300 meters, and the former three specimens were collected in December at 250 meters above sea-level. There are also two females, taken at Buena Vista, E. Bolivia, the latter belong to C. M. Acc. No. 5573. All of them were taken by J. Steinbach. The type, a female, belongs to C. M. Acc. No. 5060.

107. *Henia testacea* sp. nov.

As shown by the synoptical key the present species differs from the others in its more robust form and prevailing brunco-testaceous color.

Length of body, ♂, 21 mm.: of pronotum, 4.1 mm.; of tegmina, 17.5 mm.; of hind femora, 13 mm.

Habitat: A single male, the type, comes from the Province del Sara, Bolivia, where it was collected by J. Steinbach during the period of November-December, 1912, at an altitude of 350 meters above sea-level. C. M. Acc. No. 5058.

Genus CORNOPS Scudder.

Cornops SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 276 (1875); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 31 (1894), XIII, no. 311, p. 45 (1898); BRUNER, Journ. N. Y. Ent. Soc., XIV, p. 152 (1906); *IB.*, Proc. U. S. Nat. Mus., XXX, p. 662 (1906), etc.

108. *Cornops bivittatum* Scudder.

Cornops bivittatum SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 276 (1875); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 32 (1894).

Two females and one male from the Province del Sara, Bolivia, are referred to Scudder's species *bivittatum*. They were collected by J. Steinbach at an altitude of 350 meters. C. M. Acc. No. 5058. There is another female from the Rio Japacani, eastern Bolivia, taken by the same collector in Feb., 1915. C. M. Acc. No. 5573.

109. *Cornops longipenne* De Geer.

Acrydium longipenne DE GEER, Mém. Ins., III, p. 501, no. 18, pl. 42, fig. 9 (1773). ? *Paracornops longipenne* BRUNER, Proc. U. S. Nat. Mus., XXX, p. 662 (1906).

Cornops longipenne REHN, Trans. Am. Ent. Soc., XLII, pp. 286, 287—in discussion of synonymy, Sept. 23, 1916; *IB.*, *l. c.*, XLIV, p. 204 (1918).

There are three males and three females of this insect at hand. They all come from Cayenne, French Guiana, where they were taken in April, 1917. C. M. Acc. No. 5897.

Coming from a locality so comparatively near to and similar to that, from which *Acrydium longipenne* De Geer, was derived, there can scarcely be room for doubt as to their identity. The specimens seem to agree in every respect with the original description, as well as with most of the characters mentioned by Rehn in his discussion referred to above, and based upon almost certainly authentic material.

110. *Cornops insulare* Bruner.

Cornops insularis BRUNER, Biol. Cent.-Amer., Orth., II, p. 262 (1908).

Cornops bivittatum BRUNER (*nec* Scudder), Journ. N. Y. Ent. Soc., XIV, p. 154 (1906).

Four males and two females of this beautiful insect, were collected at Cayenne, in February, March, and April, 1917. C. M. Acc. Nos. 5873 and 5897.

III. *Cornops pelagicum* sp. nov.

There is a female of what appears to be still an additional species of *Cornops* among the material now being studied. It was taken on Oucatopi Island by S. M. Klages in June, 1918. The description follows:

Medium in size; rather robust; the tegmina and the wings decidedly shorter than in such species as *longipenne*, *ignotum*, *insulare*, and *paraguayense*, with all of which it agrees fairly well in size. Head short, the front not very oblique, viewed laterally a little rounded, strongly and closely punctured; fastigium of the vertex short and wide, almost twice as wide at the base as the length, the lateral edges straight, the apex blunt, its disc depressed and provided with a wide longitudinal sulcus; antennæ slender, filiform, about reaching the apex of the pronotum; the frontal costa fairly prominent, widest above the base of the antennæ and evenly and gradually narrowing below where its sides meet and terminate just before reaching the clypeus, profoundly sulcate from a point just above the antennæ. Vertex about one and three-fourths as wide as the diameter of the rather large subconical basal antennal joints, but little depressed; occiput short, gently rounded. Pronotum strongly punctate, sub-cylindrical, a little widest behind, the hind margin broadly angulate, the median carina fairly prominent back of the last transverse sulcus, but diminishing cephalad. Tegmina very little longer than the abdomen, their apex rounded. Hind femora robust at base, but slender on the apical half, their genicular lobes elongate and finely acuminate, almost spiniform; the hind tibiæ strongly expanded apically, and with the fringe of hairs on their inner margin quite dense and noticeable, the spines large and tipped on outer half or third with deep black. Prosternal spine erect, a little transverse, elongate, and broadly rounded at its apex. Valves of the ovipositor short, broad, the outer margin armed with about a dozen small teeth, the inner margin provided near its middle with several, while the bulging disc is thickly studded with them, giving it a sharply granular appearance.

General color olive-green above, becoming grass-green on the tegmina. Paler beneath, where the prevailing hue is flavous. Sides of

the head, upper half of the sides of the pronotum and pleuræ heavily longitudinally striped with black, the upper edge of which gradually merges with the dorsal color. Genicular area of the hind femora and the base of the tibiæ scarcely marked or even tinged with black, fuscous, or ferruginous. Antennæ dark olive-green.

Length of body, ♀, 27 mm.; of pronotum, 5 mm.; of tegmina, 21 mm.; of hind femora, 14.5 mm.; of antennæ 8.5 mm.

The type is unique, and belongs to C. M. Acc. No. 6178.

Genus TETRATÆNIA Stål.

Tetratænia STÅL, Recens. Orth., I, pp. 34, 53 (1873); KIRBY, Syn. Cat. Orth., III, p. 418 (1910). For further bibliography see Kirby, *l. c.*

The genus *Tetratænia* is composed of several species of medium-sized, highly colored locusts, which, judging from the greatly lamellate edges of the hind tibiæ, live among aquatic plants. At least a half dozen species are known.

112. *Tetratænia phila* Rehn.

Tetratænia phila REHN, Proc. Acad. Nat. Sci. Philad., May, 1918, pp. 172-175, Pl. I, figs. 25, 27.

The specimens were at first doubtfully determined as *Gryllus surinamus* Linnæus, but, when compared with the description of Rehn's new species *T. phila*, their identity with it was at once detected. There are four males and two females. They are labelled as follows: one male and a female, "Cayenne, Mch., C. M. Acc. 5897," a male and female "Oucatopi Island, S. M. Klages, June, 1918, Acc. 6178"; one male (imperfect) "Cayari Island, Uassa Swamp, May, 1918, Acc. 6177"; and a male, Benevides, Pará, Brazil, Oct. 1918, also taken by Klages, C. M. Acc. 6174.

These specimens are very uniform in both size and color.

113. *Tetratænia australis* sp. nov.

There is a single mutilated male of a species of *Tetratænia* from the Province del Sara, Bolivia, collected by J. Steinbach during the period March-April, 1913, at an altitude of about 350 meters above sea-level. Although the mutilation consists in the absence of both hind legs, it seems worth while to briefly characterize it under the above name, since it seems to come from the most southern locality from which a representative of the genus is recorded.

In color this specimen approaches *surinama* and in size is slightly larger than the largest specimen of *surinama* as recorded by Rehn (Proc. Acad. Nat. Sci. Philad., May, 1918, p. 172) where he mentions the variability of the species.

Head large, the occiput short, smooth, bullate; vertex between the eyes a very little greater than the diameter of the basal antennal joint; the fastigium of the vertex short, depressed, broadly sulcate at middle, the sulcation gradually, roundly, and faintly merging into that of the frontal costa, which latter is rather prominent above between the bases of the antennæ, but quickly lowers at the ocellus and below, continuous but inconspicuous to the clypeus. Antennæ filiform, quite coarse, about one-half longer than the head and pronotum combined. Pronotum glabrous, but quite closely punctulate and rugose, save at its sides between the hind sulcus and the anterior margin, where the surface is almost smooth; anterior margin a little advanced upon the occiput, the middle angulately emarginate, the hind border broadly angulate, but with the apex triangularly emarginate, the transverse sulci profound; the median carina rather coarse, cut by all three sulci. Tegmina of moderate width, the costal margin somewhat broadly and shallowly lobate near the base, reaching well beyond the tip of the abdomen, apex rounded. Apex of the abdomen slender, the last ventral segment and subgenital plate pale, smooth, and together forming a differentiated area, appearing quite different from the other ventral portion and directed obliquely upward, the sub-genital plate on its outer half compressed to about one-third of its basal width, the apex narrowly prow-shaped, entire; cerci elongate, abruptly bent both upwards and inwards, the slender finger tapering but little, so that the two by bowing inwards touch their tips above the apex of the supra-anal plate, which latter is formed somewhat like that in other members of the genus, as are also the lobes of the preceding segment in advance of the bases of the cerci. Prosternal spine rather long and slender, evenly conical, acuminate. Mesosternal lobes separated by a space a little less than the width of the lobes themselves.

General color dark olive-green with the usual longitudinal pallid lines and the broad band of black on the sides of head, pronotum and pleura separating these lines of yellow as described for both *T. surinama* and *T. phila*. Base of the anterior and median femora tinged with coral-red; the apical lobes or geniculæ of the middle femora

larger and more rounded than in *surinama*, the superior apical spine short and heavy.

The type is the property of the Carnegie Museum and belongs to Acc. No. 5058.

Genus COPIOCERA Burmeister.

Copiocera BURMEISTER, Handb. Ent., II, pp. 602, 611 (1838); STÅL, Bihang Svensk. Akad. Handl., V, no. 4, p. 38 (1878); BRUNER, Biol. Cent.-Amer., Orth., II, pp. 213, 263 (1913); REHN, Proc. Acad. Nat. Sci. Phil., 1913, pp. 94-96, figs. 7, 8.

Glaphyracris WALKER, Cat. Derm. Salt. Brit. Mus., IV, p. 653 (1870).

This genus is composed of moderately large, elongate, dusky colored insects, the majority of the species of which have their abdomens more or less conspicuously ornamented with orange or red maculations. They are distributed throughout South America from the Isthmus of Panama to northern Argentina. Up to the present time nine, or possibly ten, supposed species have been recognized and described. Two others are now added. These may be separated by the annexed key:

SYNOPSIS OF THE SPECIES OF COPIOCERA.

- A. Smaller (♂, 28-31 mm.; ♀, 30-34 mm.).
- b. Antennæ with their basal segments somewhat flattened, subsensiform, dorsum of the pronotum and occiput provided with a median dusky longitudinal line. *eucera* Marschall.
 - bb. Antennæ filiform, in nowise subsensiform.
 - c. Abdomen varicolored, provided above with orange or reddish maculations or ground.
 - d. Abdomen with the dorsum blood-red, the sides and underside black. *hamalonata* Burmeister.
 - dd. Abdomen above pale sanguineous, with the sides flavo-maculate. *lata* Gerstaecker.
 - cc. Abdomen not varicolored.
 - d. Abdomen red. Sides of the pronotum concolorous or unicolorous. *nigricans* Walker.
 - dd. Abdomen olivaceous, becoming darker above. Sides of the pronotum marked with a large orange area. *collaris* Bruner.
- A.A. Larger (♂, 32-36 mm.; ♀, 42-48 mm.).
- b. Antennæ somewhat robust, subsensiform, the basal joints somewhat dilated and flattened.
 - c. Dorsum of the occiput and the pronotum provided with a longitudinal black line. Antennæ red. *erythrogaster* Perty.
 - cc. Dorsum of the head and the pronotum not provided with a longitudinal fuscous line. Antennæ black. *surinamensis* Rehn.

bt. Antennæ slender, filiform, the sub-basal joints not noticeably flattened or dilated.

c. General color greenish olive above, paler below; anterior and middle legs more or less sanguineous.

d. Smaller (♂, 32-35 mm.; tegmina 24-37.5 mm.).

e. Abdomen without red or orange-colored maculations. Anterior margin of the pronotum and the inner face and lower edge of the hind femora concolorous.

lepida Gerstæcker.*

ee. Abdomen brightly and largely red maculate. Anterior margin of the pronotum narrowly yellow-bordered, followed by a narrow collar of black. Inner face and lower margin of hind femora bright blood-red.

formosa sp. nov.

dd. Larger (♂, 36 mm.; tegmina 32 mm.). Hind tibiæ dusky vinaceous.....*boliviana* sp. nov.

cc. General color darker.

d. Fusco-olivaceous, moderately slender...*specularis* Gerstæcker.

dd. Reddish brown, robust.....*austera* Gerstæcker,

114. *Copiocera surinamensis* Rehn.

Copiocera surinamensis REHN, Proc. Acad. Nat. Sci. Philad., Mich. 1913, pp. 94-96, figs. 7, 8.

I am referring a single male specimen belonging to this genus to Rehn's *C. surinamensis*. It is from the Mana River in French Guiana, where it was taken in May, 1917. C. M. Acc. No. 6008.

Its measurements are: Length of body, ♂, 30 mm.; of pronotum, 4.75 mm.; of tegmina, 25 mm.; of hind femora, 13.5 mm. In color it agrees well with Rehn's description of his female type, save that the anterior and median femora are brighter, almost blood-red.

115. *Copiocera lepida* Gerstæcker?

Copiocera lepida GERSTÆCKER, Mitth. Ver. Neu-Vorpomm. u. Rügen, XX, p. 34, no. 28 (1889); KIRBY, Syn. Cat. Orth., III, p. 420 (1910).

A single female specimen of a *Copiocera* found in the collection now being studied is referred with some hesitation to *C. lepida* of Gerstæcker. It might, however, be referable to *C. prasina* Rehn, the description of which I did not have before me at the time of determining the material in hand. This specimen comes from Benevides, Pará, Brazil, near the place where Rehn's type was obtained. It was taken by S. M. Klages in October, 1918. C. M. Acc. No. 6174.

* Rehn's *C. prasina* possibly belongs about here in the table.

116. *Copiocera formosa* sp. nov.

This is a very beautiful species, having the general appearance of *lepida*, *prasina*, and *boliviana*, but differs from all of them in several respects other than in coloration.

Moderately slender and longer-winged than usual. Head, pronotum, pleura, outer face of the hind femora and most of the intermediate portion and the apex of the anterior femora, together with the front tibiæ bright olive-green; inner face and lower sulcus of the hind femora bright blood-red. Greater portion of the dorsal sclerites of the abdomen likewise of this color, the extreme edges alone narrowly bordered with black. Venter flavous, tinged lightly with rose. Anterior and lower margins of the pronotum, together with the carinæ bordering the insertion of the legs, narrowly white, or pale citron-yellow; the anterior edge of the pronotum of the same color, followed by a wider band or collar of deep black. Hind tibiæ bright red, somewhat darkened exteriorly, the spines black. Antennæ black, without the usual pallid apical joints. Apex of the hind femora having the genicular area mostly black, varied above with a rather large triangular, and at the sides a small rounded patch of yellow, also with a pregenicular annulus of the same color. Coxæ of all the legs and basal half of the anterior pair strongly tinged with reddish purple.

Vertex between the eyes a little wider than the diameter of the basal antennal joint, the fastigium of the vertex a little elongate, rather widely and deeply sulcate, this sulcation somewhat continuous with that of the frontal costa; the latter broadly, rather deeply and roundly, sulcate from its start to the transverse facial depression, beyond which it quickly fades away; the lateral walls sharp; pronotum short, its surface coarsely and closely punctulate, the transverse sulci straight, fairly deeply impressed; anterior and posterior margins of the disc rounded, the median carina only present on the posterior lobe. Tegmina of normal width, rather elongate and with the veinlets few; this last mentioned feature is especially noticeable on the dorsal and costal fields, but is also apparent even on the disc, where there is a well-defined intercalary vein. Anterior and middle legs small and very slender, the femora scarcely at all enlarged or inflated; the posterior femora also very slender; hind tibiæ few-spined externally, on one leg two- and on the other three-spined, and the spines located apically; internally provided with the normal nine spines. Apex of the male abdomen of the usual form, the cerci long,

cylindrical, straight, the supra-anal plate smooth, red; outer or apical margins of the last ventral segment flavous, the disc black, its middle slightly and angulately produced. Prosternal spine very large and transverse. Ivory-white.

Length of body, ♂, 33.5 mm.; of pronotum, 5 mm.; of tegmina, 31.5 mm.; of hind femora, 15 mm.; of antennæ, 20 mm.

The type, a male, and the only specimen at hand, is from the Mana River, French Guiana, where it was collected in June, 1917, by S. M. Klages. C. M. Acc. No. 6008.

117. *Copiocera boliviana* sp. nov.

A moderately large but slender insect with the head, thorax, tegmina, and outer face of the hind femora dark grass-green or light olive-green. Inner face and lower sulcus of the hind femora and the femora of the anterior and middle legs above deep carmine. Hind tibiæ also tinged with carmine, although somewhat infuscated. Abdomen above pallid, but strongly tinged with vinaceous pink, the base, apex, and extreme lateral edges of all the dorsal sclerites infuscated; ventral surface olivaceous, the prosternal spine dirty cream-color. Antennæ filiform, black, except the two basal and four or five apical joints, which are pallid, a little longer than the hind femora. Eyes moderately prominent, bronze, or brassy. Pronotum with the median longitudinal carina tinged with vinaceous. Apical portion of the hind femora largely dirty white, except the inner lobes, which are dull black. Wings light fuscous, but with the immediate base cerulean, the veins dark.

Length of body, ♂, 36.5 mm.; of pronotum, 6 mm.; of tegmina, 32 mm.; of hind femora, 17 mm.

Habitat: The only specimen at hand, the type, bears the label "Las Juntas (250 M.), Department Sta. Cruz, Bolív., Steinbach." It was taken in December, 1913. C. M. Acc. No. 5060.

This insect seems to come nearest to *C. lepida* Gerstæcker, from which it differs in its larger size and longer tegmina, besides in the color-markings of the abdomen.

118. *Copiocera austera* Gerstæcker.

Copiocera austera GERSTÆCKER, Mitth. Ver. Neu-Vorpomm. u. Rügen, XX, p. 36 (1889); *IB.*, Charakt. einer Reihe bemerk. Orth., p. 78 (1888).

Four specimens, two males and two females, from Las Juntas,

Santa Cruz, Bolivia, are referred to Gerstæcker's *austrera*. They were taken at an elevation of from 250 to 300 meters above sea-level by J. Steinbach. C. M. Acc. No. 5060. One male from Buena Vista and a female from the Rio Japacani, eastern Bolivia, are also referred to this species. They were likewise taken by Steinbach. C. M. Acc. No. 5573.

Genus ZOSPERAMERUS Bruner.

Zosperamerus BRUNER, Biol. Cent.-Amer., Orth., II, p. 214, 274 (1907-8); IB., Ann. Carnegie Mus., VIII, p. 94 (1911).

There is at hand a single female specimen of a locust of this genus, which seems to be undescribed. In order to show its relationship to the forms already known the synoptic key published in a former volume of the ANNALS (VIII, p. 94) is modified to include it and herewith presented. A second species is also included in material which has arrived later.

SYNOPSIS OF THE SPECIES OF ZOSPERAMERUS.

- A. Size smaller (♀, 20 to 22 mm.; ♂, 17 mm.). General color greenish olive to dark bruneo-cinereous or even ferruginous, varied with bands and mottlings of dirty white or testaceous and black.
- b. Femora of all the legs conspicuously banded with pallid and fuscous. [Nicaragua, Central America.] *zonatipes* Bruner.
- bb. Femora less conspicuously, or not at all, banded.
- c. Face, cheeks, lateral lobes of the pronotum, pleura, and the hind femora conspicuously marked with dirty white patches [Peru].
albopictus Bruner.
- cc. Face, cheeks, lateral lobes of the pronotum, pleura and the femora very obscurely, or not at all, thus marked.
- d. Pallid markings on face, cheeks, lateral lobes of the pronotum, pleura, and hind femora testaceous. [Pará, Brazil.]
brasiliensis Bruner.
- dd. Insect entirely without pallid maculations or bands on legs. Pronotum and tegmina vittate with black. Hind femora olive-green, the knees ferruginous. [Bolivia.]
vittatus sp. nov.
- AA. Size larger (♀, (?), ♂, 27 mm.). General color luteous, varied with red and black [Pará, Brazil] *marginalis* Walker.

119. *Zosperamerus brasiliensis* Bruner.

Zosperamerus brasiliensis BRUNER, Ann. Carnegie Mus., VIII, pp. 94-96 (1911).

The present species is represented in the collection before me by a single female. It comes from Uassa Island, Uassa Swamp, where it was taken in June, 1918, by S. M. Klages. C. M. Acc. No. 6167.

120. *Zosperamerus vittatus* sp. nov.

The smallest representative of the genus so far as known, and easily separated from the other species by the entire absence of pallid maculations. Head, pronotum, meso- and metathorax, and tegmina bruno-ferruginous, quadrivittate with black.

Head about as broad as the anterior margin of the pronotum; the front somewhat oblique, the occiput rounded; vertex between the large prominent eyes very narrow, its width no more, or scarcely as great, as the diameter of the slender antennæ; fastigium of the vertex depressed, rather small, about as long as wide, gently sulcate, and separated from the frontal costa by an arcuate, blunt, transverse ridge; the costa somewhat produced above the antennæ, plane, its greatest width a little more than twice that of the vertex, gradually narrowing below, sulcate just above the ocellus and below, almost terminating in the middle of the front at the rather large transverse callosities of the face. The latter coarsely rugose-punctulate; the lateral facial carinæ coarse, gently bowed outward at their middle and reaching the clypeus. Antennæ slender, about one-fourth longer than the head and the pronotum combined, the basal joint rather large. Pronotum punctulate, a little longer than wide, expanding posteriorly, the anterior margin sinuate, the posterior one widely rounded; median carina of equal prominence throughout, thrice severed by the transverse sulci, the last about one-third the length of the pronotum from its hing margin; the lateral carinæ wanting. Tegmina gently tapering, the apex rounded and reaching the hind edge of the eighth abdominal segment; wings reaching the tips of the tegmina, strongly infuscated at least apically, the disc and base not visible in the only specimen before me. Hind femora robust, about reaching the tip of the abdomen. Valves of the ovipositor, especially the upper pair, heavy, and coarsely toothed, the apex a little curved upwards, lower pair smaller, weaker, and much shorter; the supra-anal plate moderately large, its general form triangular, greatly arched at middle, and provided with an apical prolongation or finger, which is longitudinally sulcate. Mesosternal lobes widely separated, the prosternal spine acuminate. Hind tibiæ and tarsi hirsute, the former with five spines on the outer edge, seven internally; the hind tarsi with the first joint much longer than the second and about equal to the third.

Length of body, ♀, 20 mm.; of pronotum, 4 mm.; of tegmina, 11 mm.; of hind femora, 10.5 mm.

Habitat: Las Juntas, Department of Santa Cruz, Bolivia, where it was captured at an elevation above sea-level of 250 meters, in December, 1913, by J. Steinbach. C. M. Acc. No. 5060.

Genus ADELOTETTIX Bruner.

Adelotettix BRUNER, Horæ Soc. Ent. Rossicæ, XXXIX, p. 476 (1910); *IB.*, Ann. Carnegie Mus., VIII, pp. 485-486, footnote (1913).

This genus, as stated by me in these ANNALS (Vol. VIII, p. 97), is confined to neotropical America. At least three species have already been described. A fourth appears now to be at hand. They may be recognized by the subjoined key, which is a modification of one prepared by me and appearing in the paper above cited.

SYNOPSIS OF THE SPECIES OF ADELOTETTIX.

- A. Tegmina rather sparsely veined, especially apically.
- b. Hind tibiæ brunneo-testaceous, nine-spined on both edges. The pronotum collared with black. [Yucatan]. *collaris* Bruner.
 - bb. Hind tibiæ more or less colored with vinaceous or red, fewer-spined on both edges.
 - c. Hind tibiæ with the basal half obscure cinereous, the apical portion deep red. Pronotum not collared with black, wings vitreous, strongly infuscated apically. *obscurus* Bruner.
 - cc. Hind tibiæ vinaceous red. Pronotum pale, bordered and collared with black. Wings cerulean, but little infuscated apically [Cayenne]. *cæruleipennis* sp. nov.
- AA. Tegmina profusely veined, even on the apical half. Hind tibiæ and tarsi vinaceous red [Pará, Brazil]. *brunneus* Bruner.

121. *Adelotettix cæruleipennis* sp. nov.

Related to both *collaris* and *obscurus*, but distinct, as shown by reference to the above key of species. Especially characterized by the blue wings and the pale-bordered as well as pale-collared pronotum.

Size above medium, rather robust, the front and cheeks below the eyes rather closely, but not deeply, punctate; the pronotum and pleura of meso- and metathorax strongly and profusely punctate. Head a little wider than the anterior edge of the pronotum, the occiput rather short and bulging; eyes large and prominent, about two-fifths longer than the anterior margin of the cheeks, separated at the vertex by a space a little greater than the diameter of the basal antennal joint, somewhat depressed and gently sulcate; the fastigium of the vertex not quite horizontal, a trifle longer than its basal width, longitudinally

carinated at middle, its lateral edges straight and converging gently forward, the extreme apex truncate and separated from the costa by a transverse ridge which is elevated at the center. Frontal costa prominent between the antennæ, where it is about one-half wider than the vertex, plane, or minutely and sparsely punctulate, suddenly lowered at the ocellus and below, where it is sulcate, its sides pinched at the transverse facial depression; lateral or facial carinæ prominent, straight, divergent, and reaching the base of the clypeus at its outer angles, apparently continuous as prominent longitudinal ridges on the mandibles. Antennæ black, robust, a trifle longer than the head and pronotum together, the apical four joints pallid. Pronotum selliform, its anterior lobe cylindrical, the posterior lobe flattened above, and with its sides rather strongly divergent, the last transverse sulcus located at about the middle, the median carina plainly apparent on the hind, sub-obliterated on the anterior, lobes; anterior margin somewhat rounded at its middle, the hind margin subangulate. Tegmina and wings fully developed, reaching beyond the apex of both the hind femora and the abdomen, rather sparsely veined, especially on the apical two-fifths. Hind femora robust, not reaching the apex of the abdomen; anterior and median legs small, the femora but little enlarged; the hind tibiæ and tarsi lengthily hirsute, the latter with the second joint two-thirds as long as the first, the former eight-spined interiorly, seven-spined externally. Prosternal spine robust, short, its apex broadly rounded; interspace between the mesosternal lobes about as wide as the lobes themselves, the inner margins of which are broadly rounded.

General color of insect above dark bruneo-olivaceous, below and the front tinged with pale testaceo-ferruginous. Wings largely deep cerulean, the veins apically fuliginous and the intervening membrane a little infuscated.

Length of body, ♀, 39 mm.; of pronotum, 7.5 mm.; of tegmina, 34 mm.; of hind femora, 18 mm.

The only specimen at hand, the type, comes from Cayenne, French Guiana, where it was taken in February, 1917, by S. M. Klages. C. M. Acc. No. 5873.

Genus BUCEPHALACRIS Giglio-Tos.

Bucephalacris GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 30 (1894); BRUNER, Ann. Carnegie Mus., VIII, p. 91 (1911).

The remarks offered by me, *l. c.*, p. 91, will give the reader such meager information as we possess concerning these apparently rare locusts. Since that paper appeared Rehn has described the species *falcifer*, and now there seems to be still another represented by a single male from eastern Bolivia. The table used for the separation of the four species including the two described by me in the ANNALS (*l. c.*, pp. 91-94) may be modified so as to include both *falcifer* Rehn and the new one now at hand. It follows:

SYNOPSIS OF THE SPECIES OF BUCEPHALACRIS.

- A. Form rather graceful, cylindrical, or subcylindrical. Tegmina and wings a little shorter than the abdomen; the former with comparatively few veins. Hind tibiæ glaucous.
- b. General color olivaceous, the tegmina tinged with rose or vinaceous. Size smaller (♂, ?; ♀, 23-25 mm.).
- c. Head large and decidedly wider than the front edge of the pronotum.....*borellii* Giglio-Tos.
- cc. Head smaller, but little wider than the front edge of the pronotum.
fuscipennis Bruner.
- bb. General color dull grayish brown, the tegmina not tinted with rose or vinaceous.
- c. Size larger (♀, 30 mm.). Hind femora provided with three fuscous bands, inner face and lower sulcus of the femora blood-red.
paraguayensis Bruner.
- cc. Size smaller (♂, 20 mm.). Hind femora provided with two dim fuscous bands, their inner face and lower sulcus flavous.
boliviana sp. nov.
- AA. Form rather robust. Tegmina considerably shorter than the abdomen; the former rather closely veined. Hind tibiæ coral-red.
- b. Head about as wide as high. Upper lateral edges of the pronotum conspicuously banded lengthwise with fuscous. Length of the body greater (♀, 28.5 mm.).....*corallipes* Bruner.
- bb. Head higher than wide. Upper lateral edges of the pronotum not conspicuously banded lengthwise with fuscous. Length of the body less (♂, 17.6 mm.; ♀, 25.8 mm.).....*falcifer* Rehn.

122. *Bucephalacris boliviana* sp. nov.

A medium-sized insect which is possibly most nearly related to the species *B. paraguayensis* Bruner and *B. borellii* Giglio-Tos.

Head large, decidedly wider than the anterior edge of the pronotum, the occiput short, bullate; the eyes very large and prominent, fully twice as long as the anterior edge of the cheeks, separated above at the

vertex by a space only a trifle greater than the diameter of the second antennal joint, the fastigium of the vertex depressed in front, somewhat broader at its base than the length, the anterior edge broadly truncate. Frontal costa prominent above between the antennæ, almost twice the width of the vertex, its surface coarsely punctulate, below the ocellus narrowing one-half and sulcate, continuous to the clypeus. Antennæ filiform, moderately coarse, a little longer than the hind femora. Front sloping to the rear. Pronotum short, the hind lobe shortest, and with its sides a little divergent caudad; hind margin subtruncate, the anterior edge at middle widely and shallowly emarginate. Tegmina and wings about a fifth shorter than the abdomen. Legs rather robust, the anterior and middle pairs with inflated femora, the hind pair also rather robust; the hind tarsi and tibiæ lengthly and rather profusely hirsute, the former with the three joints about equal in length. Prosternal spine bullate, large, hairy. Last ventral segment of the abdomen of the male somewhat longer than wide, its apex blunt, entire; cerci broad at base, emarginately and roundly narrowed from above to one-fifth the basal width, and then bowed inwards and expanding into a rounded, banner-like, gently hollowed spoon, as wide across as the basal width of the cercus.

General color of insect dark wood-brown tinged with olivaceous on the sides and the disc of the pronotum, the tegmina, cheeks, pleura, and upper side of abdomen; legs somewhat paler, the hind femora showing traces of two fuscous transverse bands above, cheeks below and back of the eyes, middle of sides of the pronotum and pleura showing dim traces of pallid maculations; genicular arches, inner genicular lobes and bases of hind tibiæ infuscated; outer margin of the banner-like apex of cerci bordered with black; antennæ dark ferruginous.

Length of body, ♂, 20 mm.; of pronotum, 3.5 mm.; of tegmina, 12.5 mm.; of hind femora, 10 mm.

Habitat: The only specimen, the type, comes from Buena Vista in eastern Bolivia, where it was taken by J. Steinbach. C. M. Acc. No. 5573.

Genus PHEOPARIA Stål.

Phaoparia STÅL, Recens. Orth., I, pp. 36, 56 (1873); *IB.*, Syst. Acrid., pp. 57-59 (1878); BRUNER, Biol. Cent.-Amer., Orth., II, pp. 215, 277 (1907-8).

123. *Phæoparia boliviana* sp. nov.

Related to *linea-alba* Linnæus and *castanea* Brunner, but larger, and with more or less well-defined maculations on the proportionately longer tegmina. General color brunneo-ferruginous, variegated with flecks and mottlings of piceous on the body, legs, and tegmina. Tegmina plainly, but very narrowly, marked with the oblique pallid interrupted line, so characteristic of the former of the two species, from which that species derived its name, and with which it has been compared.

Length of body, ♂, 31 mm., ♀, 46 mm.; of pronotum, ♂, 6 mm., ♀, 8 mm.; of tegmina, ♂, 31 mm., ♀, 41 mm.; of hind femora, ♂, 18 mm., ♀, 25 mm.

Habitat: The male type is from the Province del Sara and the female from Quatro-Ojos, Department of Santa Cruz, Bolivia. The former was collected during the period March-April, at an elevation of 350 meters, and the latter in November, 1913, at an elevation of 300 meters above sea-level. In addition there are two males which were taken, one at Quatro-Ojos, and the other at Las Juntas in the Department of Santa Cruz. All of this material was collected by J. Steinbach.

124. *Phæoparia castanea* (Brunner).

Opomala castanea BRUNNER, Verh. Zoöl.-Bot. Ges. Wien, XI, p. 225 (1861).

Phæoparia castanea STÅL, Bihang. Svensk. Akad. Handl., V (4), p. 57 (1878);

BRUNER, Biol. Cent. Amer., Orth., II, p. 278 (1908).

There are three males and three females before me from the Mana River and one male and a female from Pied Saut, Oyapok River, French Guiana, collected by S. M. Klages in December, 1917. C. M. Acc. No. 6111. Also a pair, male and female, from the Upper Rocana in Northern Pará, Brazil, collected by the same party in July, 1918. C. M. Acc. No. 6175.

Genus ALEUAS Stål.

Aleuas STÅL, Bihang. Svensk. Akad. Handl., V, (4), pp. 25, 69 (1878); GIGLIO-TOS,

Boll. Mus. Zoöl. Anat. Comp. Torino, III, no. 311, p. 47 (1898); BRUNER, Proc.

U. S. Nat. Mus., XXX, pp. 642, 667 (1906).

125. *Aleuas vitticollis* Stål.

Three males are placed here. They were taken by J. Steinbach in February, 1913, in the Province del Sara, Bolivia, at an elevation of 350 meters above sea-level. C. M. Acc. No. 5058.

Genus *JODACRIS* Giglio-Tos.

Jodacris GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 302, p. 32, note (1897); *IB.*, XIII, no. 311, p. 47 (1898); BRUNER, Proc. U. S. Nat. Mus., VIII, p. 104 (1911).

126. *Jodacris ferruginea* (Giglio-Tos).

Anniceris ferruginca GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 30 (1894) in part.

Jodacris ferruginea GIGLIO-TOS, *l. c.*, XII, pp. 32-33 (1897) in part; BRUNER, Locusts of Argent., p. 67 (1900), etc.

A single male of this interesting locust is at hand. It comes from Buena Vista in eastern Bolivia, where it was taken by J. Steinbach. C. M. Acc. No. 5573.

Genus *ABRACRIS* Walker.

Abracris WALKER, Cat. Dermap. Salt. Brit. Mus., IV, p. 642 (1870); KIRBY, Syn. Cat. Orth., III, p. 428 (1910); BRUNER, Ann. Carnegie Mus., VIII, p. 107 (1911).

127. *Abracris nebulosa* (Bruner).

Jodacris (?) *nebulosa* BRUNER, Locusts of Argent., p. 67 (1900).

Omalotettix nebulosa BRUNER, Proc. U. S. Nat. Mus., XXX, p. 673 (1906).

Abracris nebulosa KIRBY, *l. c.*, p. 428 (1910).

Several specimens of both sexes of this species are at hand. They come from the Province del Sara, Buena Vista, and Rio Japacani, Bolivia, where they were taken by J. Steinbach in February, March, April, and November. C. M. Acc. Nos. 5058 and 5673. Several specimens (seven males and three females) are also at hand from Cayenne, French Guiana, where they were taken in February and March, 1917. C. M. Acc. Nos. 5817, 5873, and 5897. The representatives of this and the other species of the genus are quite common in the forests of the localities in which they occur, where they are to be found among fallen leaves and on low herbaceous vegetation and the stems of woody plants as well.

Possibly a few of the Bolivian specimens referred to above should be assigned to *A. signatipes* Bruner, which according to Rehn are the same as *A. delecta* Walker.

128. *Abracris cæruleipennis* (Bruner).

Jodacris (?) *cæruleipennis* BRUNER, *l. c.*, pp. 66, 67 (1900).

Omalotettix cæruleipennis BRUNER, *l. c.*, pp. 673, 674 (1906).

Abracris cæruleipennis KIRBY, *l. c.*, p. 428 (1910).

Several specimens of the two sexes were taken at the same localities and dates as those listed under the preceding species. They form parts of the same accessions, and were collected by J. Steinbach.

129. *Abracris meridionalis* (Bruner).

Omalotettix meridionalis BRUNER, Biol. Cent.-Amer., Orth., II, pp. 280, 281 (1908).
Abracris meridionalis KIRBY, l. c., p. 428 (1910).

In addition to representatives of the preceding two species of *Abracris* I find at least four females of an insect, which seems to agree exactly with the description of *meridionalis*, and several other specimens, which do not entirely thus agree. They are from the Province del Sara, Bolivia, and were taken at practically the same season of the year by J. Steinbach. C. M. Acc. No. 5058. There is also one female from Buena Vista. C. M. Acc. No. 5573. In addition to the above I find three females labelled "Cayenne, French Guiana, March and May, 1917." The latter belong to C. M. Acc. Nos. 5873 and 6008.

Genus *VILERNA* Stål.

Vilerna STÅL, Recens. Orth., I, pp. 38, 71 (1873); BRUNNER, Ann. Mus. Genève, XXXIII, p. 139 (1893); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, p. 47 (1898); KIRBY, Syn. Cat. Orth., III, p. 429 (1910). For further bibliography of the genus see Kirby, l. c.

130. *Vilerna æneo-oculata* (De Geer).

Acrydium æneo-oculatum DE GEER, Mém. Ins., III, p. 502, pl. 42, fig. 11 (1773).
Vilerna æneo-oculata STÅL, l. c., p. 71 (1873); BRUNER, Biol. Cent.-Amer., Orth., II, p. 285 (1908). For further synonymy see Kirby, l. c., p. 430.

The collections here reported upon contain the following material which is referred to this species: two males and one female, Cayenne, French Guiana, Jan.-March, 1917, C. M. Acc. Nos. 5817, 5873, 5897; one male, Pied Saut, Oyapok River, French Guiana, S. M. Klages, C. M. Acc. No. 6173; and a single female collected on Cayari Island in the Uassa Swamp, in May, 1918. The latter belongs to C. M. Acc. No. 6177.

Genus *CALETODES* Giglio-Tos.

Caletodes GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, pp. 47, 58 (1898); KIRBY, Syn. Cat. Orth., III, p. 431 (1910).

Several locusts coming from the Province del Sara, Bolivia, are referred to this genus.

131. *Caletodes alatus* Giglio-Tos.

Caletodes alatus GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, no. 311, p. 58 (1898).

There are five females in the collection which were taken in Bolivia in October, 1913, at an elevation of 350 meters above sea-level, by J. Steinbach. C. M. Acc. No. 5058.

Genus XIPHIOLA Bolivar.

Xiphiola BOLIVAR, Act. Soc. Españ. Hist. Nat., XXV, p. 17 (1896); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XIII, p. 48 (1898); BRÜNER, Proc. U. S. Nat. Mus., XXX, pp. 642, 674 (1906); IB., Ann. Carnegie Mus., VIII, p. 116 (1911).

This genus is composed of small or medium-sized locusts having striking color-patterns. They must dwell among rank vegetation growing in shady forests, upon the stems of low shrubs, or upon the bark of trees. Only two species are known.

132. *Xiphiola cyanoptera* Bolivar?

Xiphiola cyanoptera BOLIVAR, l. c., p. 17 (1896); GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XV, no. 377, p. 5 (1900).

Although this insect has been reported heretofore only from Peru, there are four specimens of a locust before me, which apparently belong to Bolivar's *X. cyanoptera*. They come from the Mana River in French Guiana, where they were taken in May and June, 1917. C. M. Acc. No. 6008.

I do not happen at present to have before me Bolivar's paper containing the original description of the species *cyanoptera*, and the quotations from it made by Giglio-Tos in his tabulated comparison with his new *X. borellii* do not appear sufficient to permit of my being entirely certain as to the identity.

133. *Xiphiola borellii* Giglio-Tos.

Xiphiola borellii, GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XV, no. 377, p. 5 (1900); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 674 (1906); IB., Ann. Carnegie Mus., VIII, p. 116 (1911).

The present species is represented by a male and a female from Buena Vista and a single male from the Rio Japacani in eastern Bolivia, where they were taken by J. Steinbach. C. M. Acc. No. 5573.

This insect seems to be rather common in portions of northern

Argentina, in Paraguay, in southern Brazil, and in eastern Bolivia. It apparently frequents rather open woods, where it may be found near the ground among fallen leaves, on twigs, herbs, etc., if we are permitted to base our surmises upon its general color-scheme.

Genus OSMILIOLA Giglio-Tos.

Osmiliola GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, XII, no. 302, p. 32 (1897); *IB.*, XIII, no. 311, p. 48 (1898); BRUNER, 2d Rep. Locust Comm. B. Aires, pp. 54, 68 (1900); KIRBY, Syn. Cat. Orth., III, p. 432 (1910).

134. *Osmiliola aurita* Giglio-Tos.

Osmiliola aurita GIGLIO-TOS, *l. c.*, XII, no. 302, p. 33 (1897); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 674 (1906); *IB.*, Annals Carnegie Mus., VIII, p. 116 (1911).

There is a single female which I am inclined to place here, although it does not exactly agree with the original description given by Giglio-Tos. It is either a rare insect, or else its habits are such as to preclude its capture by ordinary methods of collecting. Its rather wide distribution appears to indicate that it may be commoner than is at present believed. It has been taken heretofore in northern Argentina, in Paraguay, and Brazil. The specimen at hand comes from Buena Vista in eastern Bolivia, where it was captured by J. Steinbach. C. M. Acc. No. 5573.

Genus RHABDOSCIRTUS Bruner.

Rhabdoscirtus BRUNER, Ann. Carnegie Mus., VIII, p. 116 (1911).

The genus *Rhabdoscirtus* was erected for an insect coming from Demarara, British Guiana, and contained in the collection of the present writer.

135. *Rhabdoscirtus vittatus* Bruner.

Rhabdoscirtus vittatus BRUNER, *l. c.*, p. 117 (1911).

This species is represented by a single female from Pied Saut, Oyapok River, French Guiana, collected in November, 1917, by S. M. Klages. C. M. Acc. No. 6111.

Genus OMMATOLAMPIS Burmeister.

Ommatolampis BURMEISTER, Handb. Ent., II, p. 636 (1838). For a bibliography of the genus see KIRBY, Syn. Cat. Orth., III, p. 433.

136. *Ommatolampis peruviana* Bruner.

Ommatolampis peruviana BRUNER, Horæ Soc. Ent. Rossicæ, XXXIX, pp. 482-483, Dec. 1910.

I find a mature female of this insect taken near the Rio Japacani in February, 1915, and also an injured immature specimen, labeled "Buena Vista, E. Bolivia." Both were collected by J. Steinbach. C. M. Acc. No. 5573.

Genus *EUSITALCES* Bruner.

Eusitalces BRUNER, Ann. Carnegie Mus., VIII, p. 142 (1911).

137. *Eusitalces vulneratus* sp. nov.

Considerably larger and somewhat more robust than *E. vittatus*, the type of the genus, which was described in the ANNALS, *l. c.*, pp. 143-144. General color greenish olive, black, and yellow, the pronotum above and on the sides conspicuously marked with large orange-red maculae.

Head of moderate size, as wide as the anterior margin of the pronotum, the occiput rounded, short, the vertex narrow, not sulcate, about as wide as the diameter of the second antennal joint (σ^7) or a trifle greater (φ); fastigium of the vertex depressed, subtriangular, a little broader at its base than long, not at all sulcate, but rather with its disc gently convex, the sides and anterior margins coarsely carinate; the frontal costa a little prominent and plane, provided with a few coarse punctures between the antennæ, about as wide, or a trifle wider than the diameter of the first antennal joint, very inconspicuous below, but nevertheless reaching the clypeus. Eyes rather prominent, in the male about one-third, in the female one-fourth, longer than the cheeks below them. Antennæ filiform, somewhat longer than the head and pronotum combined. Pronotum coarsely punctulate, more closely so on the posterior lobe, expanding caudad; transverse sulci profound; the median carina prominent, coarse, severed by the posterior sulcus; the lateral carinae absent; anterior margin sinuous, a little advanced on the occiput, and with the middle widely emarginate; posterior edge triangular and likewise emarginate at its middle. Tegmina lateral, small, covering the auditory apparatus, their apex about reaching (φ) or a little surpassing (σ^7) the hind margin of the first abdominal segment. Hind femora somewhat robust at their base,

evenly tapering apically, where they are slender; the genicular lobes triangular, acuminate; tibiæ and tarsi hirsute, the external margin of the tibiæ eight-spined instead of six-spined as in *vittatus*. Anterior and middle legs normal. Abdomen of male a little clavate apically, the last ventral segment triangular, upturned, its apex entire; supra-anal plate large, subquadrate, the lateral margins near the base elevated, sinuose, the disc at middle profoundly elevated longitudinally leaving broad lateral depressions; the marginal apophyses of the preceding segment forming slender adjacent fingers one-third the length of the plate. Cerci large, heavy at base, forked, elongate, and curved, the inner branch heavier and directed upwards, inwards, and a little to the front, their apices almost touching; the outer branch slenderer and curved backwards, upwards, and only slightly inwards; valves of the ovipositor rather long and strong, only moderately hooked; mesosternal lobes separated by a space a little wider than the width of the lobes themselves. Prosternal spine slender, acuminate, emanating from a robust quadrate elevation of the surface of the sternum.

Head with the front, middle, anterior, and lower margins of the cheeks, occiput at sides and middle, most of the disc of the fastigium, two basal joints of the antennæ, the median carina, and sides of the disc of the pronotum, middle, and sides of the dorsum of the abdominal segments and lines on the pleura, bright yellow; remainder of head, disc, and sides of the pronotum, dorsum of the abdomen, together with the sides of the meso- and metathorax, and basal abdominal segments, black. Tegmina black, with a median and dorsal vitta of yellow. Legs and lower side of body greenish olive; the geniculæ of the hind femora black, preceded by a flavous annulus. Antennæ dull ferruginous in the male, testaceous in the female.

Length of body, ♂, 18 mm., ♀, 21.5 mm.; of pronotum, ♂, 4 mm., ♀, 4.15 mm.; of tegmina, ♂ and ♀, 2 mm.; of hind femora, ♂ and ♀, 5 mm.

Habitat: One male and one female, from the Province del Sara, Bolivia, were found at an elevation of 350 meters above sea-level. They were taken in October, 1913, by J. Steinbach. C. M. Acc. No. 5059. A second male is also at hand. It was taken by the same collector at Quatro-Ojos, Department of Santa Cruz, Bolivia, and is made the male type because of its better condition. Two additional males and a female bear the locality label "Buena Vista,

E. Bolivia." They were also taken by Steinbach. C. M. Acc. No. 5573.

Genus SCHISTOCERCA Stål.

The insects, which form the genus *Schistocerca*, are all large in body and ample in length of wing. Hence many, if not all of them, are at times apt to wander far from region to region over most of the subtropical and tropical lands of the Western Hemisphere. Like many other groups of locusts, the different forms tend to vary more or less markedly in color, as well as to a certain extent in size. A number of them change color a couple of times during their lives. Especially is this last statement true with reference to the forms which hibernate in the imaginal stage. Many of the species have been described time and again by different writers, who have had occasion to study them. This state of affairs has resulted in a rich and complicated synonymy, difficult to decide without a great amount of material from various localities and access to the types for comparison. Then, furthermore, the earlier writers made their descriptions so brief, that they apply quite as well as two or more species or forms, as we understand them today.

In the present paper, accordingly, no attempt will be made to discuss the synonymy and probable distribution of the several species coming under notice.

138. *Schistocerca flavolinea* sp. nov.

A remarkably large and strikingly colored insect, which runs to the vicinity of *flavofasciata* in Scudder's Table of the Species of *Schistocerca* as published on pages 442-447 of Vol. XXXIV of the Proceedings of the American Academy of Arts and Sciences. It naturally belongs with my species, *Schistocerca formosa* and *Schistocerca magnifica*, when size and beauty is considered. The former comes from Colombia, and the latter from the Bahamas. Our new form is an east Bolivian insect.

Head comparatively narrow, not quite as wide as the anterior margin of the pronotum, its depth one-half greater than the width; viewed laterally the front is broadly rounded, and somewhat retreating below. Occiput short, rather full or rounded; the vertex between the eyes not depressed and about as wide as the lesser diameter of the inconspicuous eyes; the fastigium of the vertex is gently depressed,



short, fully twice as wide at its base as long, scarcely, sulcate and without definite bounding carinæ; the frontal costa is rather prominent, the sides almost parallel, sulcate throughout, and rather coarsely punctulate at sides and on the carinæ, especially above and towards the clypeus; the antennæ are long and slender, reaching considerably beyond the caudal margin of the pronotum. The latter with the sides of the anterior lobe nearly parallel, the sides of the hind lobe rather strongly divergent caudad; disc somewhat full, in front sub-tectate, viewed laterally gently arcuate, the hind lobe flat, the median carina rather prominent on the hind lobe, but becoming less so cephalad; transverse sulci deep, but not especially wide; the hind margin at middle forming a right angle; lateral lobes deep or high behind, the lower edge rather strongly obliquely sinuose. Legs somewhat robust and elongate. Tegmina greatly elongate, of moderate width, extending fully one-fourth of their length beyond the apex of the hind femora and the tip of the abdomen. Prosternal spine small, slender, cylindrical, nearly erect, its apex rounded.

General color brunneo-ferruginous. Middle of the occiput and the pronotum provided with a prominent longitudinal bright ferruginous band, inclining to orange, bordered on the head with black, starting in front at the very top of the frontal costa and narrowing from the last transverse sulcus of the pronotum to the apex of the disc. Lower edges of the lateral lobes of the pronotum rather prominently bordered with a wide but irregular yellowish patch. Costal margin of the tegmina on their basal third also provided with a conspicuous testaceous stripe. Antennæ bright orange-ferruginous, exterior face of the hind femora dirty white; their genicular arcs and lobes testaceous, the lunules more or less piceous; hind tibiæ brunneo-cinereous, tinged with purplish.

Length of body, ♀, 66 mm.; of pronotum, 14 mm.; of tegmina, 65.5 mm.; of hind femora, 38 mm.

Habitat: The type, the only specimen seen, comes from the Rio Japacani in eastern Bolivia, where it was collected by J. Steinbach in February, 1915. C. M. Acc. No. 5573.

139. *Schistocerca flavofasciata* (De Geer).

A female specimen coming from the "Province del Sara, Bolivia" and taken by J. Steinbach in April, 1913, is referred here. Several

specimens taken in French Guiana are also referred to this species, though in the latter case with some doubt. C. M. Acc. Nos. 5873, 6008, and 6173.

140. *Schistocerca fimbriata* (Thunberg).

Gryllus fimbriatus THUNBERG, Mém. Acad. St. Petersb., V, p. 247 (1915).

I have here placed a single female coming from Quatro-Ojos, in the Department of Santa Cruz, Bolivia. It was taken in November, 1913, at an altitude of 300 meters above sea-level.

141. *Schistocerca pallens* (Thunberg).

Gryllus pallens THUNBERG, Mém. Acad. St. Petersb., V, p. 237 (1815).

Among the material coming from Nueva Gerona on the Isle of Pines, West Indies, are three females, which are referred to Thunbergs *Gryllus pallens*.

142. *Schistocerca inscripta* (Walker).

Cyrtacanthacris inscripta WALKER, Cat. Derm. Salt. Brit. Mus., III, p. 550 (1870).

Acridium inscriptum THOMAS, Syn. Acrid. N. Amer., p. 228 (1873).

Schistocerca inscripta SCUDDER, Proc. Amer. Acad. Arts & Sci., XXXIV, pp. 444, 461 (1899).

The collections coming from Nueva Gerona, Isle of Pines, contain twenty-one females and seven males of Walker's *S. inscripta*.

There seems to be very little variation both as to size and coloration in specimens of this species.

143. *Schistocerca americana* (Drury).

Gryllus americanus DRURY, Ill. Nat. Hist., I, p. 128, pl. 49, fig. 2 (1770), etc.

Two males and a female of this widely distributed species are at hand from Cayenne, French Guiana, taken February, 1917. C. M. Acc. No. 5873.

144. *Schistocerca* sp.?

In addition to the forms mentioned above there are three nymphs of possibly still another species of *Schistocerca* at hand. They come from the Isle of Pines and were taken at Nueva Gerona.

Genus MONACHIDIUM Serville.

Monachidium SERVILLE, Ann. Sci. Nat., XXII, p. 281 (1831). For further bibliography of this genus see Kirby, Syn. Cat. Orth., III, p. 463.

145. *Monachidium lunum* (Johansen).

Gryllus lunus JOHANSEN, ANCH. Acad., VI, p. 397 (1763). For synonymy see Kirby, *l. c.*

A single female specimen of this remarkably and strikingly colored locust is at hand. It comes from Pied Saut, Oyapok River, French Guiana, where it was taken in March, 1918, by S. M. Klages. C. M. Acc. No. 6173.

Genus *DICHOPLUS* Stål.

Dichroplus STÅL, RECCENS. ORTH., I, pp. 78 (1873); BRUNER, Proc. U. S. Nat. Mus., XXX, pp. 643, 677 (1906), etc.

146. *Dichroplus punctulatus* (Thunberg).

Gryllus punctulatus THUNBERG, Mém. Acad. St. Petersb., IX, pp. 395, 408 (1824).
Dichroplus punctulatus GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 21 (1884), etc.

Rio Bermejo, Province of Salta, Argentina, one female, taken May, 1914, at an altitude of 400 meters above sea-level; and one male and three females from the Province del Sara, Bolivia, taken in December, 1913, and March and April, 1912, by J. Steinbach. In addition to these there are three males and two females collected at Cayenne, French Guiana, during February and March, C. M. Acc. Nos. 5873 and 5897; and two males from the Mana River, French Guiana, May, 1917, C. M. Acc. No. 6008.

147. *Dichroplus exilis* Goglio-Tos.

Dichroplus exilis GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 23 (1894), etc.

The collections made by J. Steinbach in the Province del Sara, Bolivia, contain a pair of this species. C. M. Acc. No. 5058. They were taken during the period March-April, 1913, at an elevation of 350 M. above sea-level. There is also a single female from Buena Vista, eastern Bolivia. C. M. Acc. No. 5573.

Genus *PARASCOPAS* Bruner.

Parascopas BRUNER, Proc. U. S. Nat. Mus., XXX, pp. 643, 689 (June, 1906);
GIGLIO-TOS, Boll. Soc. Españ. Hist. Nat., VI, p. 293 (July, 1906).
Scopas GIGLIO-TOS (*nec* BON.), Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 28 (1894), XIII, no. 311, p. 50.

148. *Parascopas obesus* (Giglio-Tos).

Scopas obesus GIGLIO-TOS, Boll. Mus. Zoöl. Anat. Comp. Torino, IX, no. 184, p. 28 (1894).

Parascopas obesus BRUNER, Proc. U. S. Nat. Mus., XXX, p. 689 (1906).

The collections made by J. Steinbach at Buena Vista, eastern Bolivia contain a pair of *P. obesus* Giglio-Tos *in coitu*. C. M. Acc. No. 5573.

149. *Parascopas sanguineus* Bruner.

Parascopas sanguineus BRUNER, Ent. News, XXI, p. 306-7 (1910).

Two males and two females of this interesting species are at hand. They come from the Province del Sara, Bolivia, where they were collected during the period embraced in the months of February to April inclusive. They come from an altitude of 350 meters above sea-level. C. M. Acc. No. 5058. An additional male bears the label "Rio Japacani, E. Bolivia, Feb. 1915" It also was taken by Steinbach, and belongs to C. M. Acc. No. 5573.

Genus *LEIOTETTIX* Bruner.

Leiotettix BRUNER, Proc. U. S. Nat. Mus., XXX, pp. 643, 684 (1906); REHN, Proc. Acad. Nat. Sci. Phil., 1907, p. 188.

150. *Leiotettix viridis* Bruner.

Leiotettix viridis BRUNER, *l. c.*, p. 685 (1906); REHN, *l. c.*, p. 188 (1907).

The collection made by J. Steinbach during November and December, 1912, contains two males and one female, and possibly a third male, which are referable to this species. They come from an elevation of 350 meters above sea-level in the Province del Sara, Bolivia. C. M. Acc. No. 5058.

The third male, just referred to, differs from the others in having the sides of the pronotum provided with a well defined dusky band and the four basal abdominal segments at their sides largely glossy black. Otherwise, so far as the structure of the apical portions of the abdomen is concerned, it is practically the same as typical *viridis*. In addition I find a male from Buena Vista, Bolivia, which belongs to C. M. Acc. No. 5573.

151. *Leiotettix sanguineus* Bruner.

Leiotettix sanguineus BRUNER, *l. c.*, pp. 685, 687 (1906); REHN, *l. c.*, p. 187 (1907).

One specimen of each sex from the "Province del Sara, Bolivia,"

collected by J. Steinbach, in March and April, 1913, are referred here. They were taken at about 350 meters above sea-level. C. M. Acc. No. 5058.

Genus *PARADICHROPLUS* Brunner.

Paradichroplus BRUNNER, Ann. Mus. G n ve, XXXIII, p. 145 (1893); GIGLIO-TOS, Boll. Mus. Zool. Anat. Comp. Torino, IX, no. 184, pp. 20, 25 (1884); XIII, no. 311, p. 50 (1898); BRUNER, Proc. U. S. Nat. Mus., XXX, p. 692 (1906); *IB.*, Ann. Carnegie Mus., VIII, p. 137 (1911).

152. *Paradichroplus fusiformis* Giglio-Tos.

Paradichroplus fusiformis GIGLIO-TOS, *l. c.*, XII, no. 302, p. 35 (1897); BRUNER, *l. c.*, XXX, pp. 692, 693 (1906); VIII, pp. 138, 140 (1911).

Two females and one male of this genus are referred to *P. fusiformis* Giglio-Tos.

They are from the Province del Sara, Bolivia, where they were taken by J. Steinbach. The male specimen bears the date November, 1911, and one of the females March, April, 1913. They were taken at an altitude of approximately 350 meters above sea-level. C. M. Acc. No. 5058.

153. *Paradichroplus geniculatus* Bruner.

Dichroplus geniculatus BRUNER, Ann. Carnegie Mus., VIII, pp. 138, 139 (1911).

There are three specimens of this species before me, one male and two females. They were taken at the same locality as the preceding. The male and one female bear the date of February, 1913, while the other female was captured in November, 1911. They were all collected by Mr. J. Steinbach. C. M. Acc. No. 5058. Two additional females from Buena Vista, E. Bolivia, were taken by the same collector. The latter belong to C. M. Acc. No. 5573.

154. *Paradichroplus sanguineus* sp. nov.

A small, and in fact the smallest, species thus far recognized. It comes next to *fusiformis* Giglio-Tos in the synoptical key as given on pages 499-500, of Vol. VIII of these ANNALS. In order to include it in that table, the key would have to be modified as follows:

AA. Hind tibi  provided with eight spines in the outer row.

b. Hind tibi  of the normal form, etc. * * *

c. Larger (♀, 22-28 mm.).

cc. Smaller (♀, 18-21 mm.).

d. Color testaceo-ferruginous, etc.

- dd.* Color more or less markedly olivaceous. Hind tibiæ greenish. Internal and external discs of the hind femora not especially infuscated.
- e.* Genicular area of the hind femora marked with black lunules.
- f.* Cheeks, lower part of the lateral lobes of the pronotum and the legs pale yellowish. Abdomen at its sides from the base to its middle, nigro-maculate.
- fusiformis* Giglio-Tos,
- ff.* Cheeks, lower part of the lateral lobes of the pronotum testaceous, the legs greenish olive. Abdomen not maculate with black, but with the sides of segments 1-6 largely bright blood-red. . . . *sanguineus* sp. nov.

Head of moderate size, about as wide as the anterior edge of the pronotum, the front moderately oblique, the occiput rather short, and strongly rounded; vertex strongly depressed, narrower than the diameter of the basal antennal joint, rather deeply and linearly sulcate, the sulcation becoming more profound and much deeper anteriorly upon the fastigium of the vertex; the latter greatly depressed and of moderate size, a little wider than long, and with heavy lateral walls; frontal costa rather prominent, wide, continuous to the clypeus, and broadly sulcate throughout; antennæ filiform, greenish-yellow, about reaching the apex of the first abdominal segment. Pronotum gently widening behind, about as long as its greatest width, the surface punctulate, on the hind lobe more densely so; transverse sulci profound; the anterior and posterior margins of the disc a little roundly emarginate. Tegmina small, lateral, not quite reaching the hind margin of the first abdominal segment, about three times as long as their greatest width, the disc provided with three rather heavy longitudinal veins. Legs robust, the hind femora extending beyond the tip of the abdomen of the male by the length of the genicular portion; hind tibiæ strongly hirsute, eight-spined externally and nine-spined internally. Tip of the abdomen scarcely enlarged, the last ventral segment short, smooth, the apical margin squarely truncate; supra-anal plate rather large, a fourth longer than its basal width, evenly, but not rapidly, narrowing towards its apex, the lateral edges gently raised and giving the plate a hollowed appearance, the apex suddenly, but obliquely, narrowed, and ending in an acute angle; the basal half, or a little more, provided with a deep, acute, and heavily bounded V-shaped sulcus in or above which are two long pointed finger-like projections from the hind margin of the preceding segment; cerci

simple, their length about two and one-half times their greatest basal width, acuminate, hirsute; the prosternal spine rather robust at its base, evenly tapering, the apex slenderly acuminate and directed gently cephalad.

General color greenish testaceous, a little paler below. Sides of the head back of the eyes, and sides of the pronotum marked with a moderately broad longitudinal fuscous band; middle of occiput, the disc of pronotum at middle, the transverse sulci of latter, the dorsal abdominal carina, and the apical margins of three segments also narrowly infuscated. Legs greenish, the hind tibiæ dark sea-green. Eyes castaneous. Tegmina dark ferruginous, the interspaces between the veins fuscous. Sides of the abdominal segments one to six and metapleura bright blood-red.

Length of body, ♂, 15 mm.; of pronotum, 3 mm.; of tegmina, 2.3 mm.; of hind femora, 9.5 mm.

Habitat: The single specimen, a male, and the type of the species, comes from Buena Vista in eastern Bolivia, where it was taken by J. Steinbach. C. M. Acc. No. 5573.

Genus OSMILIA Stål.

Osmilia STÅL, Recens. Orth., I, p. 68 (1873); KIRBY, Syn. Cat. Orth., III, p. 539 (1910). For further bibliography see Kirby, *l. c.*

155. *Osmilia flavolineata* (De Geer).

Acrydium flavolineatum DE GEER, Mém. Ins., III, p. 497, pl. 42, fig. 4 (1773). For synonymy see Kirby, *l. c.*

This species is represented in the material now being reported upon by the following specimens: One male and a female, Cayenne, French Guiana, February and March, 1917, C. M. Acc. No. 5873; one male, one female, from the Mana River, French Guiana, May. The latter pair belongs to C. M. Acc. No. 6008.

Genus RHYTIDICHROTA Stål.

Rhytidichrota STÅL, Recens. Orth., I, pp. 35, 54 (1873); *IB.*, Bihang. Svensk. Akad. Handl., V, no. 4, pp. 34, 75 (1878); BRUNNER, Ann. Mus. Genève, XXXIII, p. 148 (1893); BRUNER, Biol. Centr.-Am., Orthop., II, p. 337 (1908); *IB.* Ann. Carn. Mus., VIII, p. 141 (1910); *IB. l. c.*, p. 505 (1911).

The insects, which are included in this genus, are all confined to the tropical portions of America. They are of medium size, apterous, and

may be recognized by their having the hind femora provided apically below with rather large tubercles and spines or teeth. Nine species have already been described and now a tenth is added. They may be separated by the accompanying key modified from that given by me in Volume II of the Orthoptera of the *Biologia Centrali-Americana*.

A. Posterior tibiae armed externally with seven spines.

b. Larger (σ^7 , 22 to 24 mm.; ♀ , 25-32 mm.).

c. Antennae distinctly ensiform. General color obscure, greenish olive; the hind tibiae apically, along with the tarsi, miniateous.
ensicornis Stål.

cc. Antennae very narrowly and obsoletely subensiform or linear.

d. General color varying from coral-red to subolivaceous black. Surface of the head, thorax, and the basal abdominal segments, above granulose*varicolor* Stål.

dd. General color yellowish-testaceous. Surface of the head, thorax, and basal abdominal segments rugose above.
seliata Stål.

bb. Smaller (σ^7 , 15-17 mm.; ♀ , 22 mm.).

c. Surface rather densely pilose. Geniculae of the hind femora dense sanguineous*pilosa* Stål.

cc. Surface with but few hairs. Geniculae of the hind femora black. Cerci robust*peruviana* Bruner.

AA. Posterior tibiae armed externally with eight spines.

b. Dorsum of the pronotum and the basal abdominal segment on each side provided with smooth, somewhat elevated, callosities.

c. Body and the head above strongly rugoso-punctulate. General color clay-yellow*antennata* Stål.

cc. Body and the head above less strongly punctulate. Color sub-ferruginous-olivaceous, the head black. Legs greenish olive, the hind geniculae subsanguineous*laevifrons* Stål.

bb. Dorsum of the pronotum and the basal abdominal segment above without the callosities, but sometimes with glabrous areas.

c. Larger (σ^7 , 27 mm.; ♀ , ?). The glabrous areas present, but inconspicuous. General color pale yellowish olive. Dorsal field of the abdominal segments provided with two prominent circular black spots, one on either side*boliviana* sp. nov.

cc. Smaller (σ^7 , 14.5 mm.; ♀ , 22 mm., ?). Without the glabrous areas referred to above. General color variable.

d. Frontal costa plain, not sulcate. Body and head above densely and strongly rugoso-punctate. Color yellowish testaceous.
turgida Stål.

dd. Frontal costa sulcate. Body and head above less densely punctulate and hirsute. Color obscure olive-green.

bruneri Stål.

156. *Rhytidichrota peruviana* Bruner.

Rhytidichrota peruviana BRUNER, Horæ Soc. Ent. Rossicæ, XXXIX, p. 487 (1910).

Two males from Las Juntas, Santa Cruz, Bolivia, belong here. They were collected by J. Steinbach in December, 1913, at an elevation of 250 meters above sea-level. C. M. Acc. No. 5060.

157. *Rhytidichrota boliviana* sp. nov.

Related to *lævifrons* and *antennata* of Stål, but lacking the shining callosities on the pronotum and the basal abdominal segment, as mentioned in connection with the descriptions of those species. Large and robust. Inner, lower, and outer faces of the hind femora strongly tinged with carmine.

Head of moderate size, about as broad as the anterior margin of the pronotum; the occiput strongly rounded, comparatively smooth; the eyes fairly prominent, nearly twice as long as the anterior margin of the cheeks below them, separated above by a narrow space, the sides of which are strongly carinated, the carinæ diverging anteriorly on the basal portion of the fastigium of the vertex; this latter of medium size, quadrate, and with the disc depressed and rugoso-granulate; frontal costa somewhat prominent above between the antennæ, about twice the width of the vertex, plain above, becoming sulcate towards the central ocellus and continuing to the base of the clypeus. Antennæ rather robust, but not at all ensiform, or sub-ensiform, as in *ensicornis* and allies, about as long as the hind femora. Pronotum with its surface shining, though coarsely and shallowly punctulate, the anterior lobe a little more than twice the length of the posterior, and with the sides parallel; the hind lobe with its sides divergent posteriorly, the transverse sulci moderately strongly impressed, the median carina present only on the hind lobe, very faint; the front margin rounded, shallowly emarginate at its middle, the hind margin straight. Dorsum of pro- and mesonotum and basal abdominal segments rugoso-punctulate. Body entirely apterous. Anterior and middle legs robust, the femora swollen; hind femora long, and rather robust at their base, gently tapering apically, the upper carina serrate basally, the lower carina strongly toothed on its apical half; the hind tibiæ heavy, their outer margin armed with eight, the inner with nine spines. Cerci short, robust, a little tapering, directed upwards, the cephalic margin produced into an inwardly

directed forked process about two-thirds as long as the heavier basal part. Apex of the abdomen terminating in a short cone. Supra-anal plate of the type specimen obscured by being depressed apically and covered by the soft male appendages that were protruded before drying. Prosternal spine small, acuminate, on a robust quadrate base.

General color pale yellowish olive, with the legs a little more greenish. Dorsum of abdominal segments three to seven inclusive conspicuously marked with two black spots, one on either side near the longitudinal carina. Basal lower half of the hind femora tinged interiorly, externally, and below with carmine. Apex of two basal abdominal segments above piceous. Upper third of the outer face and apical half of the inner face of the hind femora infuscated. Eyes castaneous. Antennæ pale at base, becoming darker apically.

Length of body, ♂, 27 mm.; of pronotum, 5.85 mm.; of hind femora, 16 mm.

Habitat: The only specimen at hand, the type, comes from the Province del Sara, Bolivia, where it was taken in the period including March–April, 1913, by J. Steinbach at an elevation of 350 meters above sea-level. C. M. Acc. No. 5058. I also find among additional material received since the above description of the male was drawn up another male and two females. These come from Buena Vista, Bolivia, and were taken by the same collector and belong to C. M. Acc. No. 5573.

The female does not differ materially from the male except in size and in the greatly reduced size of the large spines on the lower carina of the apical half of the hind femora. The measurements of this sex are: length of body, 30 mm.; of pronotum, 5.5 mm.; of hind femora, 16 mm.